PROCEEDINGS

of the Marine Safety Council

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Front cover:
The grounded fishing vessel *Marlu*. Photo by MST2 Jason Wishart of Marine Safety Field Office, Cape Cod, MA.

Back cover:
Galapagos Island Oil Spill, Puerto Moreno on Isla San Cristobal; The F/V *Jessica* spilled about 200,000 gallons of oil into an environment known for unique wildlife and aquatic species on Jan. 16, 2001. The accident was caused by heavy seas and constant swells.

Assistant Commandant's Perspective

By RADM Paul Pluta
Assistant Commandant For Marine Safety & Environmental Protection

This issue of the Marine Safety Council's *Proceedings* magazine is the first to be published during my tenure as the Assistant Commandant for Marine Safety and Environmental Protection. I am very pleased that authors from across the nation and indeed from around the world have contributed articles for this special edition of *Proceedings*, and I look forward to productive collaborations with all fishermen and safety professionals to make the industry safer.

The Coast Guard has had a long history of involvement in efforts to improve safety in the commercial fishing vessel industry. Our most significant success has come with the passage of the Commercial Fishing Vessel Safety Act of 1988. The Act allowed us to promulgate regulations specifically aimed at enhancing commercial fishing vessel safety by establishing carriage requirements for lifesaving and other emergency response equipment such as EPIRBs, life rafts, and survival suits. The Act has clearly helped reduce fishing fatalities. A comparison of the total deaths experienced in the five-year period preceding the Act to a five-year period after the Act was implemented reveals a 33 percent reduction in loss of life. Despite these improvements, fishing vessel losses and related fatalities continue to occur at an unacceptable high rate. The recent sinking of the F/V *Arctic Rose* in the Bering Sea and the loss of her 15 crewmembers underscores our need for continued vigilance.

As the late RADM Gene Henn said in a 1991 special edition of *Proceedings* that dealt with fishing vessel safety issues, "The Coast Guard's goal remains unchanged—saving lives and preventing injuries at sea...The Act deals almost exclusively with safety equipment. Fishermen must know how to use that equipment, which requires education and training. We believe that training is the key to minimizing risks in the industry." Ten years later, the Coast Guard continues to raise the bar for safety by stressing the importance of compliance with the existing safety equipment requirements and training. Various Coast Guard studies reveal that about 80 percent of all accidents have their root cause in the human element and improvements in crew knowledge is a potential remedy to effectively address the human factors that often lead to tragedies.

Special recognition must go to the members of the Commercial Fishing Industry Vessel Advisory Committee (CFIVAC) who have provided sound advice to the Coast Guard in the development of the Coast Guard's Action Plan. This plan is an 11-point initiative to increase safety within the industry by attacking the most prevalent risk factors. The committee, which acts in an advisory capacity to the Coast Guard on matters relating to commercial fishing vessels, has proven to be a steadfast partner in developing reasonable and effective tools to improve safety.

The Coast Guard is committed to improving safety in the fishing industry so that it is no more dangerous than any other maritime industry. I look forward to the many challenges we may face in overcoming hurdles that slow the rate of change, and I am confident that significant improvements can and will be made to make fishing a safe industry in which to work.

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By the Way... Editor's Point of View

It is with great pride that the National Maritime Center presents this Fishing Vessel Safety issue of the *Marine Safety Council Proceedings*. Our pride comes from the fact that we introduce you to Jesi Kettler, a 1997 graduate of Clinch Valley College, University of Virginia's College at Wise. She works for Potomac Management Group, Inc. Jesi made the transition from Editor of the *Marine Safety Newsletter* into the position of Technical Writer/Desktop Publisher.

I am certain that you will agree as you look at this issue of *Proceedings* that we have in fact made the perfect selection. Publishing a prestigious magazine such as *Proceedings* is no small endeavor. It requires hours of dedication, researching articles, finding appropriate photographs and visuals, checking content accuracy, and reviewing. You actually read and reread articles until you start living the stories in your dreams. Countless hours are spent checking format, placing articles and visuals together so the entire magazine guides the reader from the first article to the last. Jesi has put her heart and soul into this issue and we certainly hope you enjoy *Proceedings'* Fishing Vessel Safety issue.

We are grateful for all of the article submissions for this issue. The variety of articles from authors around the world in every aspect of the fishing industry gives this publication a complete picture of the significance of continuing to review the industry and to do everything possible to improve safety in the fishing industry. It is time to take fishing off of the list as the most dangerous occupation.

I look forward to hearing from our readers with their review of Fishing Vessel Safety.

Our next issue theme will be Partnerships.

Historical Overview: "Dying to Fish, Living to Fish," Fishing Vessel Casualty Task Force Report, USCG

by Richard C. Hiscock, President, ERE Associates, Ltd.
Primary Editor, CDR Mark Prescott, USCG (G-MSO)

The Main Points

The history of fishing vessel safety has been an ongoing struggle between the rights of fiercely independent individuals willing or resigned to accept the hazards of their profession, and of those from within and outside of the industry who attempt to mitigate the extreme dangers of retrieving the ocean's bounty. This history shows numerous initiatives to raise the level of fishing vessel safety through the development of standards consistent with other sectors of the maritime industry. However, few of these efforts have succeeded.

Inspected Steam Vessels to Uninspected Fishing Vessels

Steam Propulsion Brings Standards in 1800s

After several significant casualties associated with steam plants on vessels, marine safety statutes established inspection and manning requirements for steam-propelled vessels, including fishing vessels. As steam propulsion became less prevalent, subsequent legislation required the inspection of most passenger and commercial vessels, regardless of the means of propulsion. For example, the standards to improve vessel safety have strengthened in categories including the design and construction of vessels, training and licensing of operators, and fire fighting and life-saving equipment. As a general rule, any vessel that requires inspection also must have a licensed master or operator. Efforts to gain comparable safety requirement for fishing vessels have been unsuccessful. ►

Motor Boat Act of 1910

This Act was the first statute to address safety on motor boats. The Act dealt primarily with navigation lights and sound signals, and required motor vessels to carry life preservers and fire extinguishers. It also required motor boats carrying passengers be operated by a licensed individual, although no license examination was required.

Draft Safety Legislation of 1930s: "Uninspected Vessels"

Attempts to enact safety legislation for motor fishing vessels during the 1930s were defeated by the fishing vessel and towboat interests and, as a result, the classification known as "uninspected vessel" was established. With the classification came serious limitations on the ability to develop safety requirements pertaining to fishing vessels.

There are no specific licensing requirements for masters, operators, or other personnel on commercial fishing vessels. A provision of the "Officer's Competency Certificates Convention, 1936" (46 USC 8304) does require licensed masters, mates and engineers on all documented vessels more than 200 gross tons operating on the high seas. However, this applies to fewer than 1.5 percent of domestic fishing vessels. Tonnage measurement rules permit many large fishing vessels to measure just under 200 gross tons, thereby avoiding licensing requirements.

Motor Boat Act of 1940 (MBA-40)

Although MBA-40 applied to commercial and pleasure vessels, the law's primary emphasis was limited to a few safety measures directed at vessels used for recreation. The law was not intended to address commercial vessel safety, and did not include construction standards or provide for inspection. Operators were not required to be licensed unless the vessel was carrying passengers. The portion of the act applicable to commercial fishing vessels was codified in 1983 and entitled "Uninspected Vessels Generally" (46 USC 41). Only four simple requirements applied to commercial fishing vessels: fire extinguishers, life preservers, flame arrestors, and ventilation of engine and fuel tank compartments.

Fishing Vessel Safety Bill of 1941

A bill (H.R. 3254) was introduced in 1941 specifically addressing fishing vessel safety. It proposed "to place fishing boat [15 gross tons or more, fishing outside inland waters] under the supervision of the Bureau of Marine Inspection and Navigation." It outlined specific requirements for watertight bulkheads, bilge pumps, ring buoys, life preservers, life boats, radio telephone, first aid kits, line-throwing guns, annual inspection, and the licensing of operators. Hearings were held on the bill in October 1941, at which time the bill was supported by the Atlantic Fishermen's Union of Boston representing Northeast fishermen. However, most other segments of the fishing industry opposed the measure, particularly the provisions for watertight bulkheads and the licensing of operators. This initiative died due in part to the outbreak of war.

Federal Boating Act of 1958 (FBA-58)

This act amended MBA-40, making it applicable to "every motor boat or vessel on the navigable waters of the United States..." FBA-58 required the numbering of all vessels of more than 10 horsepower, and required accidents involving numbered vessels to be reported to the state, and subsequently to be reported to the Coast Guard.

Creating Recreational "Uninspected Vessels" in 1971

The Federal Boat Safety Act of 1971 (FBA-71) established manufacturer and operator requirements and a boating safety council to work with the Coast Guard in adoption of regulations affecting recreational boating safety. FSBA-71 provided a new category of "uninspected vessel." This regulation created two distinct groups of uninspected vessels: recreational boats and all other uninspected vessels. Boats were defined as "a vessel manufactured or used primarily for noncommercial use; or leased, or chartered to another for the latter's noncommercial use; or engaged in the carrying of six or fewer passengers." FSBA-71 granted broad authority to establish recreational boating safety standards, including manufacturing requirements and mandatory safety equipment. Once again, commercial fishing vessels were excluded from comparable standards.

Alternative Safety Programs Report to Congress in 1971

The poor safety record of fishing vessels caused Congress to call for a report considering ways to reduce casualties. The Coast Guard completed this report in 1971. The report documented the fishing industry's poor safety record and concluded that one of the primary causes was that fishing vessels, with few exceptions, had been exempted from safety regulations. The study recommended licensing of masters, mandatory safety standards including full inspection and certification of new vessels, and mandatory and voluntary standards combined with inspection and certification of existing vessels.

The 1971 report also compared fishing vessels with small passenger vessels, noting that "Congress passed the first Small Passenger Vessel Safety Act in 1956 (PL-84-519) after investigations of a number of boating accidents revealed that paying passengers were being taken to sea in boats that were not structurally sound, or were overloaded." PL 84-519 required inspection of all passenger vessels carrying more than six passengers, less than 65 feet in length, and between 15 and 100 gross tons. The passenger death rate went from 29 per year to five per year after the passage of the PL 84-519. Presumably, the small passenger vessel owners at the time felt this burden would destroy their industry. Yet today, the industry is healthy, and the death rate even lower as a result of further safety measures.

Fishing Vessel Safety Draft Legislation of 1971-1976

Fishing vessel safety legislation based on the 1971 study was prepared by the Coast Guard and forwarded to the Office of Management and Budget. The National Marine Fisheries Service of the Department of Commerce recommended the Coast Guard defer action on any legislation requiring the inspection of commercial fishing vessels until NMFS concluded its study on commercial fishing vessel insurance. When the NMFS study was completed in January 1975, DOC recommended an alternative proposal to OMB for a voluntary safety program for commercial fishing vessels. In ➤

July 1975, the Department of Transportation advised OMB that the Coast Guard legislative proposal would be held back while a study of the DOC proposal was undertaken.

In July 1976, the Secretary of Transportation forwarded copies of the 1971 fishing vessel study to the Senate Committee on Commerce and the House Committee on Merchant Marine and Fisheries. However, the Secretary did not recommend the Coast Guard's legislative program, citing the inflationary impact to the economy and increased interest in a voluntary safety program by the fishing industry. This initiative for fishing vessel safety legislation died.

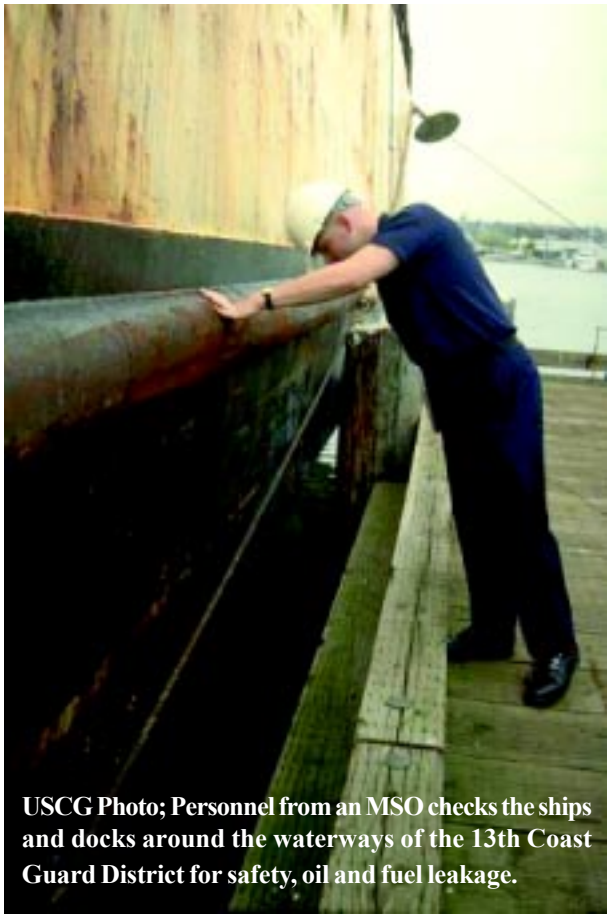
Marketing Voluntary Fishing Safety

Voluntary Exams in 1978

The Coast Guard initiated a voluntary dockside uninspected vessel examination program. The Coast Guard's 1979 budget created 45 new positions for such a program. The purpose was to improve safety throughout the uninspected commercial fleet, including commercial fishing vessels. A project to develop a triennial dockside educational examination program was initiated; however, the positions were cut in July of 1981 due to budget restrictions.

Safety Concept in 1980

"Life Safety Approach to Fishing Vessel Design and Operation" was presented to the Ship Technology and Research Symposium of the Society of Naval Architects and Marine Engineers. The Coast Guard authors (J.E. DeCarteret, N.W. Lemley and D.F. Sheehan) suggested that training, combined with the recently initiated Coast Guard education and voluntary dockside boarding program, should reduce casualties. They also made specific recommendations regarding industry training in fire safety and personnel safety and requirements for life-saving equipment. They noted, however, that if casualties continued to increase, there would be significant pressure for the government to intervene into fishing vessel design and operation.



USCG Photo; Personnel from an MSO checks the ships and docks around the waterways of the 13th Coast Guard District for safety, oil and fuel leakage.

Tragedies Lead to Modest Standards

Loss of the A-Boats in 1983

The fishing vessels *Altair* and *Americus* capsized and sank in the Bering Sea with the loss of 14 fishermen. The report resulting from the two-year joint investigation, by the Coast Guard and National Transportation Safety Board, recommended that the Coast Guard require stability analyses of new or modified vessels, and seek authority to establish minimum competency standards and licensing of fishing vessel masters. The Commandant of the Coast Guard did not concur, preferring to turn the matter over to a new full-time Fishing Vessel Safety Initiative Task Force formed in August 1984, thus continuing the pursuit of voluntary approaches to fishing vessel safety.

Voluntary Program

The Coast Guard's Task Force developed a two-pronged voluntary program. One part of the initiative was intended to promote vessel safety through voluntary standards written by the Coast Guard in five Navigation and Vessel Inspection Circulars. These voluntary standards were written primarily for fishing vessel designers, builders, outfitters, and marine surveyors. The second part of the initiative sought to promote crew safety through a guide that was developed by the Coast Guard and North Pacific Fishing Vessel Owners' Association. The NPFVOA was developing a strong safety culture stemming from the 1983 loss of the A-boats. The safety initiative became part of the Coast Guard Marine Safety Program in January 1987.

Limited Standards for Fish Processor and Tender Vessels in 1984

The House Merchant Marine and Fisheries Committee's Subcommittee on Coast Guard and Navigation held a series of hearings on marine safety in 1983. During one of the sessions, the Committee heard testimony on fishing vessel safety from three individuals representing very different points of view: a marine safety consultant testified for the need to establish a comprehensive program for fishing vessel safety in the Coast Guard's Office of Marine Safety; a representative of the National Federation of Fishermen spoke in opposition to any mandatory standards for commercial fishing vessels, preferring to leave safety to the voluntary efforts of industry organizations; and a representative of the Pacific Seafood Processors Association testified against requirements that fish processors less than 5,000 gross tons and fish tenders less than 500 gross tons to be inspected, preferring amendments to permit their continued operation as "uninspected vessels."

Insurance Crisis Hearings in 1984

During the 1980s, a crisis in insurance availability was felt throughout the nation, but particularly in the commercial fishing industry. The industry's poor safety record brought about a situation where ➤

many fishers could not obtain insurance, or, when available, could not afford to pay the premiums. In 1984, the Merchant Marine and Fisheries Committee began hearings on the availability and cost of insurance for commercial fishing vessels. The insurance industry cited as a major cost factor the special treatment afforded seafarers by the Unseaworthiness Doctrine under Admiralty Law, and the Jones Act (46 USC 688), which permits an injured seafarer the right to a jury trial. As a result of those field hearings, members of Congress began to develop legislative proposals addressing the liability and insurance issues. But a notable tragedy accelerated the debate and prospect of the nation's first fishing safety legislation.

Loss of F/V *Western Sea* in 1985

In August, the 70-year-old purse-seiner *Western Sea* departed Kodiak, Alaska with a six-man crew to fish for salmon. There were no reports that the vessel was in trouble until fishermen recovered the body of crewmember Peter Berry from the sea. An intensive search by Coast Guard cutters and aircraft failed to locate any survivors. This tragedy had a profound effect, not only on the families of those lost, but also on the drive to improve fishing vessel safety. After the death of their son, Ambassador Robert Berry and Peggy Berry worked to galvanize safety advocate, government officials, Congress, and survivors and loved ones of other commercial fishermen lost at sea, to renew the campaign for Congressionally mandated safety standards.

Fishing Vessel Safety Standards at Last ... With Limitations

In March 1987, two bills were introduced in the House dealing with fishing vessel safety and insurance liability. H.R. 1836, developed at the urging of Robert and Peggy Berry, dealt specifically with inspection, equipment requirements, licensing and training. H.R. 1841 held in June on these bills, and on the companion Senate bill S. 849 in September and December. During House testimony, the Program Manager of the Coast Guard Fishing Vessel Safety Initiative Task Force stated "the Coast Guard can support consideration for safety management in H.R. 1841, the stability criteria that is recommended by both bills and the record keeping by the insurance companies." At that time the Coast Guard did not "fully support or cannot fully support inspection, licensing, termination (of unsafe voyage, and the proposed advisory committee."

In September 1987, the National Transportation Safety Board published a comprehensive study on "Uninspected Commercial Fishing Vessels" (NTSB/SS-87/02). The NTSB added needed support for the passage of safety legislation by testifying at both hearings. Its recommendations included: safety training; basic lifesaving equipment including exposure suits, approved life rafts, emergency radios, and EPIRBs; flooding detection; de-watering systems; fire detection; fixed fire fighting systems; periodic inspection; prohibition of alcohol or drug use when engaged in commercial fishing operations; and the need for research on stability issues.

The House Committee met again in April 1988 to consider a modified version of H.R. 1841. The revised bill had been separated into Title I containing liability and compensation issues, and Title II containing the safety issues. Efforts to reach an agreement on the provisions of Title I were unsuccessful, and liability provisions were dropped. Title II required life-saving and fire-fighting equipment to be placed on board all fishing vessels with added requirements, such as immersion suits and EPIRBs, for documented vessels operating seaward of the boundary line that differentiates between the use of international and domestic navigation rules. It also required that fish processing vessels meet the standards of the American Bureau of Shipping or similar organizations; that a study be conducted by the National Academy of Engineering (National Research Council) on the safety problems of fishing industry vessels and the need for inspections; that Coast Guard develop a licensing plan; and that a fishing industry advisory committee be established. Congress, as amended, passed the bill.

On September 9, 1988, the President signed into law the Commercial Fishing Industry Vessel Safety Act of 1988 (P.L.100-424), the first safety legislation enacted in the United States applying specifically to commercial fishing vessels.

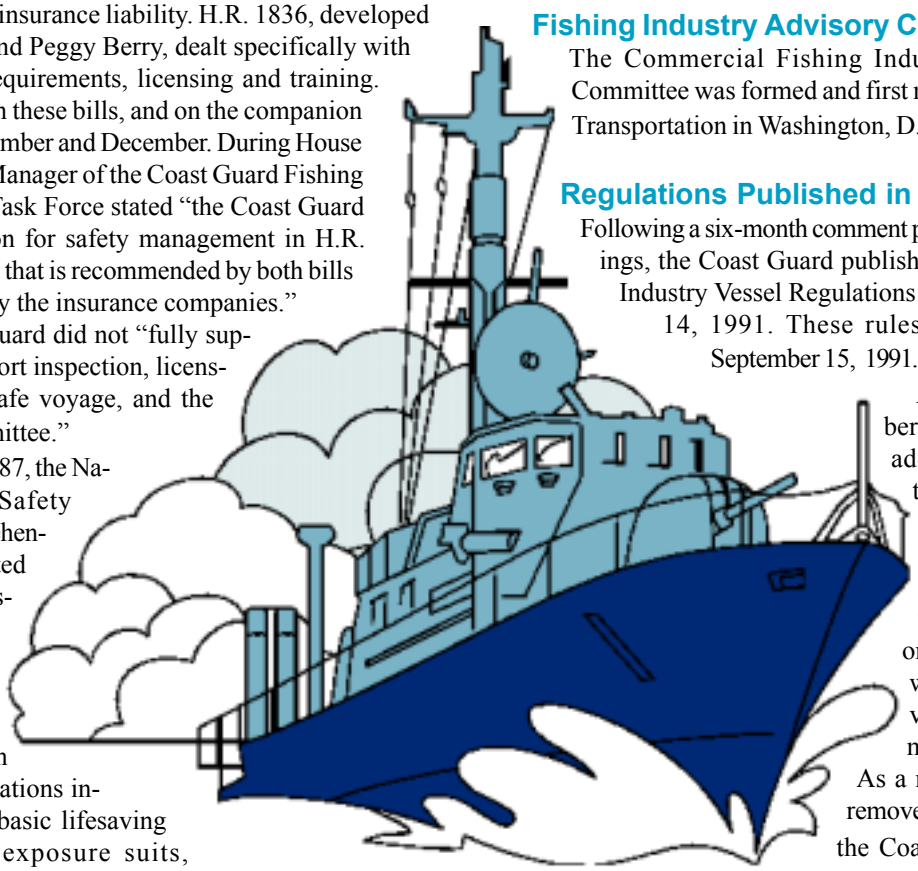
Key Events Since the Act of 1988

Fishing Industry Advisory Committee in 1988

The Commercial Fishing Industry Vessel Advisory Committee was formed and first met at the Department of Transportation in Washington, D.C. in April of 1989.

Regulations Published in 1991

Following a six-month comment period and 13 public hearings, the Coast Guard published Commercial Fishing Industry Vessel Regulations (46 CFR 28) on August 14, 1991. These rules became effective on September 15, 1991.



An overwhelming number of comments received addressed a few contentious issues, including stability requirements for vessels under 79 feet, survival craft on vessels operating inside or near the boundary lines with fewer than four individuals on board, and administrative exemptions. As a result, these items were removed from the final rule, and the Coast Guard ►

published a notice of supplemental rulemaking indicating these items would be addressed separately. The remainder of the rulemaking proceeded forward without delay, but the requirement for immersion suits for documented and state numbered vessels operating in seasonably cold waters was removed after the final rule was published because of considerable confusion over its application. A new work-plan is currently being developed to address the remaining provisions of the Commercial Fishing Industry Vessel Safety Act that do not have implementing regulations.

The Study of Fishing Vessel Safety Published

As mandated by the CFIVSA, the Secretary of Transportation arranged for the National Research Council of the National Academies of Science and Engineering to conduct a comprehensive study on fishing vessel safety, including the need for vessel inspections. This report, "*Fishing Vessel Safety, Blueprint for a National Program*," was published in 1991. On November 12, 1992, based on recommendations in the NRC report, the Secretary submitted a "Report to Congress for the Inspection of Commercial Industry Vessels." The report recommended a three-tiered inspection program for commercial fishing vessels' compliance with the mandated standards in 46 CFR 28:

1. For new and existing vessels less than 50 feet in length, it allowed for self-examination.
2. For new and existing vessels greater than or equal to 50 feet but less than 79 feet in length, it allowed for third party examination.
3. For vessels greater than or equal to 79 feet in length, more extensive Coast Guard inspections and load line assignment would be required. Additional hull and machinery standards would apply to new vessels.

Licensing Plan of 1992

On Jan. 13, 1992, the Coast Guard submitted "A Plan for Licensing Operators of Uninspected Federally Documented Commercial Fishing Industry Vessels" to Congress. The plan allowed a five-year implementation period, and for the first time permitted third-party training certification, rather than a Coast Guard examination, to demonstrate the required professional knowledge and skill levels for a license. The plan was to establish two new licenses; Master of fishing vessels less than 79 feet, and Master of fishing vessels less than 200 gross tons. Eligibility requirements included age, character, experience, physical fitness, citizenship, recency of service and English language ability. On May 24, 1993, a revised plan was submitted based on proposals by a joint Coast Guard and Advisory Committee working group.

These plans on licensing and inspection were not implemented. Several other efforts to obtain the necessary budget, resources, and authority were also unsuccessful. The Coast Guard requested licensing authority again in its FY96 Authorization Act, but Congress denied the authority based on the estimated $1 million in costs and increased burden on a depressed fishing industry.

Task Force of 1999

by Richard C. Hiscock, President ~ ERE Associates, Ltd.

Between December 1998 and January 1999, 11 fishermen died when their vessels were lost along the East Coast (F/V *Predator*, sinking, Dec. 28, 1998; F/V *Beth Dee Bob*, sinking Jan. 7, 1999; F/V *Cape Fear*, sinking, Jan. 8, 1999; F/V *Adriatic*, sinking, Jan. 19, 1999). While these terrible losses were consistent with losses that occur all around the U.S. each year, the timing of the casualties garnered a lot of media attention. The Coast Guard responded by forming a Fishing Vessel Casualty Task Force made up of representatives of the federal agencies that interact with the fishing industry (Coast Guard, NTSB, and the Occupational Safety and Health Administration) and several industry advisors including managers, trainers, investigators, and fishermen.

The Task Force met in Washington, D.C. in February of 1999, and released its report in April ("Dying to Fish - Living to Fish," Fishing Vessel Casualty Task Force Report, U.S. Coast Guard, March 1999). The Task Force posed the following question to policy makers, "Do the continued high loss rates in the commercial fishing industry represent an acceptable risk by today's standards?" The Task Force concluded, "...the risk is not acceptable, that pushing for breakthrough levels of reduced fishing industry losses is the right thing to do, and that the time is right to take on this challenge."

The Task Force recommended: operator licensing, safety inspections, stability standards, better investigations, and improvements to the Coast Guard program. Out of these recommendations the Coast Guard developed an Action Plan, including short-term program initiatives and long-term proposals, including:

- Improving drill enforcement;
- Improving casualty investigations and analysis;
- Seeking authority and funding for mandatory vessel examinations;
- Seeking authority and funding for mandatory safety training;
- Improving communication (with the industry);
- Completing the regulatory project on stability and watertight integrity begun in 1992;
- Requesting that the line used for safety equipment be changed from the Boundary Line to the baseline from which the territorial Sea is measured.

This Action Plan is yet another opportunity to "work for a breakthrough to significantly lower casualty losses." It remains to be seen whether significant progress will be made, or whether this will be yet another lost opportunity.

Progress in Prevention and Response in Fishing Vessel Safety

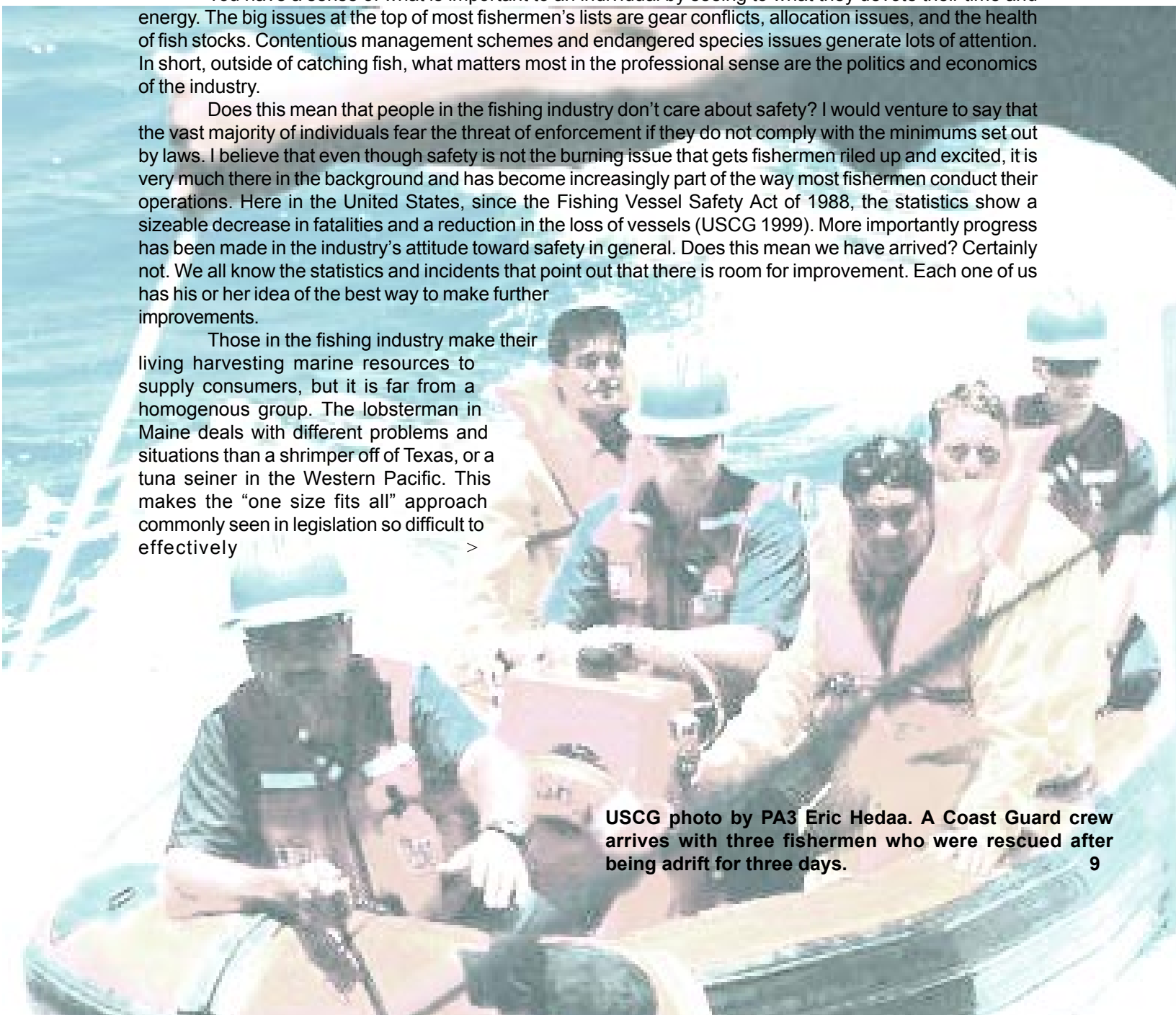
by James Herbert, Alaska Vocational Technical Center

Fishing is a global industry and in coastal waters has a history as long as mankind. According to estimates by the Food and Agriculture Organization of the United Nations (FAO), more than 15 million persons are employed aboard vessels that target marine fisheries. As might be expected, most fishermen work on vessels less than 24 meters long. The vast majority of the world's fishing vessels are under 25 gross tons and more than half of the fleet is older than 20 years. The FAO estimates that half of the world's seafood is caught or otherwise collected by small-scale fishermen operating millions of small fishing craft. For example, in the United States there are an estimated 80,000 fishing boats shorter than 10 meters, and among the Pacific Islands there are more than 40,000 small-scale fishermen at work. (FAO 2000)

You have a sense of what is important to an individual by seeing to what they devote their time and energy. The big issues at the top of most fishermen's lists are gear conflicts, allocation issues, and the health of fish stocks. Contentious management schemes and endangered species issues generate lots of attention. In short, outside of catching fish, what matters most in the professional sense are the politics and economics of the industry.

Does this mean that people in the fishing industry don't care about safety? I would venture to say that the vast majority of individuals fear the threat of enforcement if they do not comply with the minimums set out by laws. I believe that even though safety is not the burning issue that gets fishermen riled up and excited, it is very much there in the background and has become increasingly part of the way most fishermen conduct their operations. Here in the United States, since the Fishing Vessel Safety Act of 1988, the statistics show a sizeable decrease in fatalities and a reduction in the loss of vessels (USCG 1999). More importantly progress has been made in the industry's attitude toward safety in general. Does this mean we have arrived? Certainly not. We all know the statistics and incidents that point out that there is room for improvement. Each one of us has his or her idea of the best way to make further improvements.

Those in the fishing industry make their living harvesting marine resources to supply consumers, but it is far from a homogenous group. The lobsterman in Maine deals with different problems and situations than a shrimper off of Texas, or a tuna seiner in the Western Pacific. This makes the "one size fits all" approach commonly seen in legislation so difficult to effectively >



USCG photo by PA3 Eric Hedaa. A Coast Guard crew arrives with three fishermen who were rescued after being adrift for three days.

bring into practice. The diverse and regional nature of the commercial fisheries will always make enforcement of laws and policies difficult. This suggests that to be most effective we must tailor our efforts at the regional level.

A frustrating matter for safety advocates all over the world is the limited amount of resources dedicated to fishing vessel safety. For example, in the United States, the U.S. Coast Guard is the primary agency officially tasked with enforcement of vessel and fishery laws. In the eyes of Congress they seemingly have responsibility for "everything wet," and like a sheet of rubber are constantly stretching finite resources ever thinner to cover Federal mandates. Of necessity, the Coast Guard must carefully analyze how best to deploy its limited resources such as manpower, money, and machinery. This is where careful data gathering and analysis will determine the high-risk targets by region, fishery, and vessel type, and allow the Coast Guard to aim the limited resources appropriately. Again, this puts the focus on regional matters.

Communications

Getting and sharing information is vital to any professional. We know that fishermen are very keen on radios. Today, small waterproof very high frequency (VHF) radios are cheap and effective. Cell phones seem to have gained great importance in the fleet, as well. The most recent innovation that is showing up even in smaller coastal vessels is satellite phones. While not being able to get the mayday message out to anyone within radio range as with a VHF and high frequency (HF) radio, these phones give very reliable long distance communications to other vessels and land stations. U.S. Coast Guard Commandant ADM James Loy recently endorsed the National Distress Response System Modernization Project before a Senate committee. The British Columbia coast has already seen the benefits of this type of radio network.

Emergency Position Indicating Radio Beacons (EPIRBs), and now Global Position Indicating Radio Beacons (GPIRBs), have done much to facilitate rescues. There are currently more than 1 million units in use worldwide with more than 220,000 using the 406 MHz frequency (Tewel 200l). With a properly donned immersion suit and properly activated EPIRB, the odds of rescue in coastal waters is remarkably good. This is a significant technology to alert others of a crisis and allow rescuers to find those in distress. As this technology becomes more common in the recreational and charter fleets, the potential for increased false alarms may lead to different response mechanisms by rescue services or other vessels. When the 121.5 MHz frequency is phased out in a few years, we may see new frequencies adjacent to 406 MHz dedicated to this type of radio alerting.

An Emergency Positioning Indicator Radio Beacon (EPIRB) *ABOVE;* **A very high frequency radio (VHF),** *LEFT*

Weather forecasting

The science of meteorology has improved through the years. Geostationary satellites and weather buoy information combined with science provide better forecasts than ever before. The program utilized by the National Weather Service to have at-sea vessels report actual conditions to meteorologists further increases the accuracy of 12- and 24-hour forecasts.

It is wonderful that real time imagery and updates are available at sea on some vessels through the Internet. A few large vessels subscribe to private weather services. Knowing what the weather is likely to do gives a person information to make better decisions about fishing or heading to safer waters. Information is power and this is a perfect example.

Management

We can continue to focus attention on fishery management decisions that affect safety. National Standard 10 of the Magnuson-Stevens Fisheries Act requires the American Regional Fishery Councils to consider the impact on safety of any plan before them. It should be pointed out that this is only one of many standards that must be taken into account. Often the issues before these councils are extremely contentious and individuals, communities, and companies have much at stake. The situation that currently exists in New England waters illustrates the great difficulty in making decisions that move toward consensus among stakeholders and still meet the mandates of regulations and laws. The Mid Atlantic Fishery Management Council (MAFMC) took an aggressive stance in 1999 by unanimously passing a resolution that stated:

> The MAFMC hereby resolves to ensure proposed fishery management plans do not negatively impact the safety of commercial fishing vessel operations. Moreover, the MAFMC recognizes that all fishery management plans should be developed so as not to place fishermen in an environment where they must unduly hazard themselves in order to remain economically viable.

A council member who is a commercial fisherman initiated this resolution and it received unanimous support from his colleagues (Ruhle 2000).

Each Council has a Coast Guard officer as a non-voting advisor. He or she can provide advice and insight on the safety implications of council actions. >

The Individual Fishing Quota (IFQ) program was put in place in 1995 in the North Pacific to address the problems created by the overcapitalization of the sablefish and halibut fisheries. Problems included short "derby" openings (in most areas, openings lasted less than a week, sometimes for only two 24-hour periods each year). Safety concerns were also cited as one of the many problems that needed attention.

Halibut safety statistics bear out that the new system has been successful in this arena. Since the system was implemented in 1995 there have been an average of 10 search and rescue missions per year compared to an average of 28 per year in the last three years of derby fishing. With regards to sinkings, the past five years have averaged 1.2 per year compared to 2 per year during the derby fishery. Since the IFQ program began, 1.2 lives have been lost per year compared to 2 per year during the last three years with the short intense openings (IPHC 2000).

Training

Enforcement and punishment stop bad behavior but does not necessarily change a person's attitude. This is the area where training can have the greatest impact. It is one thing to have people sit in a classroom, tell them what is wrong, and tell them how to do it better. Unless they are convinced that you are right, the odds are slim that they will do anything differently once they get back on their boats. Training must be credible. If the instructor does not understand the industry or fishermen's problems, the students may not only reject the instructor and this class, but also be soured on training altogether. The most successful training organizations try to use experienced and knowledgeable instructors to gain the most positive effect.

While many nations have legal mandates and incentives for training, there can still be resistance. Training takes time and money. This can interfere with actual fishing time and boat chores, and may keep fishermen from spending time with family and friends. Accessibility to training courses and their cost is a common concern of working fishermen.

The good news is that most industry members who go through a quality training program leave with new ideas and skills that they integrate into their operations. This minimally gives them the ability to respond to emergencies aboard their vessels and builds a body of knowledge and skills to prevent those emergencies from occurring in the first place. This is the emphasis on prevention and response that is so important.

Advocacy Groups

Fisherman's wives organizations like those in Gloucester, MA, Newport, OR, and Kodiak, AK have helped bring the importance of training and safety in general to parts of the fleet. If a captian loses his vessel and the business is lost, we know who will suffer the most – certainly not the banker or the cannery. If a crew person is injured or disabled at sea, this person not only pays a price with lost income, but also the readjustments and rehabilitation down the road. So it is a strong force for change to have the families of fishermen aware and committed to the matter of safety. Those who have the greatest investment or would suffer the greatest loss should have the greatest involvement. This helps further a change in attitude.

Friends and members of the fishing industry should seek to help solve its problems. We can start with the fact that fishing takes place in an environment that is often hostile. When you are at sea, even in relatively calm weather, motion is a constant factor. In severe weather, work or even basic movements become difficult and fatiguing. We know it is a profession associated with higher than average risk. We must be careful not to oversimplify commercial fishing. This can lead to resentment by fishermen, not to mention ill-advised legislation and regulation.

We have made progress in making the fishing industry safer. There has been analysis of vessel related factors including stability and watertight integrity, material condition of vessels, and lack of safety equipment. People have examined behavioral factors such as fatigue, unsafe practices, and judgmental errors. The solutions that have been suggested will provide strategies that can prevent fishermen from being injured or killed. Other ideas will help reduce vessel casualties.

Still finding the right balance of action and responsibility by individual fishermen, vessel owners, and regulators is a question to be worked out by each country and region. Ultimately what we are trying to do is promote a change in the attitude of fishermen that makes the prevention of injuries, accidents, and losses the goal. If prevention fails, what we strive for is the ability of the individual and the system to provide an effective response. We can work toward solutions. What we can do, we must try and do.

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Commercial Fishing Vessel Safety and Fisheries Management

by Hauke L. Kite-Powell and Di Jin, Marine Policy Center, Woods Hole Oceanographic Institution
Ilene M. Kaplan, Union College and Woods Hole Oceanographic Institution

Fishing has always been a dangerous occupation. For centuries, commercial fishers have performed difficult and dangerous work on relatively small, isolated vessels, often under harsh and unforgiving weather conditions. Loss of life and vessels has always been acknowledged as part of the process of commercial fishing. In the course of the 20th century, many other industries with historically poor safety records – in manufacturing, transportation, and natural resource extraction – improved their performance and reduced losses through a combination of technological advances, safety management, and training. Commercial fishing, certainly in the United States, has not made comparable gains. The death rate for commercial fishers today is seven times the national average for all industries, and fishing remains perhaps the most hazardous occupation in the country.

Much of the focus in the debate over fishing vessel safety has been on the inadequacy of safety regulations. We believe that more attention should be paid to the safety implications of our commercial fisheries management practices. Reliance on open access systems, effort limits, and total catch quotas has resulted in excess capacity in many of the nation's fishing fleets, with too many fishers racing their competitors to the catch and taking excessive risks in the process. Relatively low prices and depleted fish stocks exacerbate the problem, making it difficult for fishers to invest in safety training and equipment. Specific management measures, such as crew size limitations and days-at-sea rules, inadvertently lead to additional risk onboard the vessels.

U.S. commercial fishers may land their catch in U.S. ports, but in fact they compete in a global market with many of their products. The United States is the world's second largest importer of seafood: in 1998, U.S. seafood imports of $8.1 billion contributed 5 percent of the nation's $164 billion trade deficit. The extensive trade in seafood products benefits U.S. consumers through improved supply and lower prices. It is less beneficial to U.S. fishers, who compete with low-cost foreign producers of wild and, increasingly, farmed seafood. In constant dollar terms, the average landed value of seafood caught by U.S. commercial fishers has decreased by 50 percent during the last 20 years to below 40 cents per pound.

In 1996, the U.S. commercial fishing fatality rate was 16 deaths per 10,000 workers, a rate 16 times higher than that for fire and police protective service occupations (USCG 1999). In Alaska, fishing is the single most hazardous industry, with 41.5 fatalities per 10,000 fishers (Schnitzer, Landen and Russell 1993).

The cornerstone of fishing vessel safety regulation in the United States is the Commercial Fishing Industry Vessel Safety Act (CFIVSA, P.L. 100-424) passed by Congress in 1988. The rules implementing the Act to date include mainly post-emergency requirements such as lifesaving gear and few preventive measures. Since the Act came into force in 1992, the U.S. commercial fishing industry has experienced a reduction by about one-fifth in fatality rates and a similar reduction in vessel accident rates. Our own assessment of the national fleet's record from 1981 to 1994 suggests that the overall vessel accident rate declined by 8 percent from 1981 to 1994. In regards to the accident rate for the national fleet, the U.S. Coast Guard (1999) found no significant decrease in vessel loss or human casualty rates from 1994 to 1998; losses averaged 16 vessels and seven deaths per month.

The death rate for commercial fishers today is seven times the national average for all industries, and fishing remains perhaps the most hazardous occupation in the country.

Most observers have concluded that fishing vessel casualty rates remain unacceptably high. A U.S. Coast Guard task force (USCG 1999) identified the main reasons for the continuing poor safety record as: (a) unseaworthy vessels (inadequate stability and compromised watertight integrity); (b) incompetent crewing and operation; (c) inadequate survival equipment; and (d) a lack of safety consciousness in resource and industry management. The solutions to most of these problems are straightforward and have been codified in a series of documents. Prominent among these are the Torremolinos Fishing Vessel Convention of 1977 and safety guidelines produced by classification societies like the American Bureau of Shipping and by the U.S. Coast Guard.

Safety regulation is important, but it is not the only factor. The fisheries resource management system affects fishing industry safety in many significant ways. Fundamentally, the "open access" management approach historically applied to U.S. fisheries leads directly to economically inefficient overcapacity in the fishing fleets, excessive harvesting of fish stocks, and an economic environment in which fishers find it difficult to operate at high levels of safety.[1] The economic inefficiency of open access has been documented at length (see Edwards and Murawski 1993; Repetto 1999). The direct and indirect effects of inefficient stock management on fishing vessel safety have received less attention.

"Open access" refers generally to a management approach that treats fish stocks as a common property resource for which fishers compete. Entry to many ➤

1 Compliance with fisheries regulations is further complicated by controversies about the accuracy of official stock assessments.

fisheries today is limited by licensing, fishing effort is curbed by restrictions on gear and days at sea, and total annual catch is limited for many species. This does not change the fundamental feature of open access management: **each fisher has an incentive to catch as much as he can before his competitors do**. One (controversial) alternative is the assignment of ownership rights in a fraction of total annual catch to individual fishers or cooperatives. This gives fishers an incentive to manage the fish stock for better yield and reduces pressure to go to sea in adverse conditions.

A prominent direct safety effect of open access management regimes comes from the competitive pressure on fishers to get to the fish first. An extreme case is the short "derby" season used in some West Coast fisheries. When the Alaskan halibut fishery was converted from a short derby season to an economically more sensible Individual Fishing Quota system in 1995, casualties, accidents, and search and rescue missions declined precipitously (Conway 2000). In other fisheries, the constraints imposed by regulators are less severe, but short seasons, limits on days at sea, and gear restrictions have become the norm in many U.S. fisheries.

In the New England scallop fishery, restrictions on days at sea, crew size, and geographic areas of operation have constrained fishers' decisions in ways they consider detrimental to safety. During the summer of 2000, we interviewed 22 boat owners, captains, and crew members in the New England scallop fishery (Kaplan and Kite-Powell 2000). Results indicate that regulations designed to reduce pressures on fish stocks may result in increased risk exposure for fishers. Two out of three respondents regard fisheries management regulations as important in affecting safety at sea. The most commonly cited safety problems with fisheries management regulations were: **Reduced crew size regulations result** in overworked and tired crew, and prevent new (inexperienced) crew members from being trained; **Limited or short-term fishing periods** pressure fishers to go to sea (or stay at sea) in bad weather or when there may be a problem with the boat; **Transiting around closed/protected areas** causes additional exposure in certain weather conditions; and **Limiting areas for fishing** can cause congestion.

Both direct and indirect effects of overcapacity and excessive harvesting on safety are pervasive. Ineffective regulation of harvesting capacity and open access have allowed a highly competitive environment to emerge in the fishing industry. The competition encourages fishers to take higher risks in order to survive economically. Management practices such as short seasons and yearly closings cause fishermen to abandon the waters their vessels were designed for and pursue fish stocks far from home port, change to new fishing gear, or enter entirely new fisheries. These changes increase the chances for accidents to occur. Dyer (2000) suggests four effects on fishing vessel operations due to depleted fish stocks and resulting stringent management regimes: lack of reinvestment in vessels and resultant poor condition, frequent shifts from one species to another without checking safety implications of gear changes, reduced crews and increased fatigue, and overloaded vessels in low unit value species. In our assessment of the factors contributing to serious accidents and loss of vessels (Jin *et al.*, in press), we found that vessel losses have been more likely during periods of depressed fish prices: an increase in the price of fish catch by $1,000 per metric ton decreased the probability of a vessel total loss by 6.3 percent.

In our assessment of the factors contributing to serious accidents and loss of vessels, we found that vessel losses have been more likely during periods of depressed fish prices: an increase in the price of fish catch by $1,000 per metric ton decreased the probability of a vessel total loss by 6.3 percent.

In conclusion, the way we manage the nation's fish stocks and fisheries has pervasive effects on risk and safety in the industry. Open access regimes lead to overcapacity and overexploitation, creating an economic climate that is inimical to safety. Management tools such as effort constraints can also exacerbate safety problems. We suggest that commercial fishing vessel safety can best be improved as follows: **Pay greater attention to safety in fisheries management plans** by: Including fishers at early stages of the management plan development process; Giving more flexibility to boats in bad weather during limited fishing periods; Revising crew size limits to reduce fatigue and allow for training new fishers. **Examine alternatives to open access management** and implement restrictions to improve incentives for fishers to conserve stocks and invest in safety; **Implement safety regulations for stability** (to prevent capsizing) and watertight integrity (to prevent flooding/sinking).

Better management of fishery resources and harvest effort could alleviate many of the safety problems we see today. Short of that, it will take more safety regulations and enforcement to change the current level of risk in the fishing industry.

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The Price of Fish: Our Nation's Most Perilous Job Takes Life and Limb in New England

by Ann Backus, Director of Outreach, Occupational Health Program, Harvard School of Public Health

Photographs by Earl Dotter, Fellow, Alicia Patterson Foundation

By the age of 32, Douglas Goodale had eight years of commercial fishing experience behind him when he lost his right arm and very nearly his life. Goodale was working by himself on his 22-foot purple lobster boat, *Barney*, about one mile off the coast of southern Maine near the Wells Harbor. The rope hauling up his third set of double traps went slack in the heavy 6-foot seas and snagged on his antiquated winch.

While reaching for the winch cut-off switch, the right sleeve of Goodale's loose fitting oil slicker got caught in the winding rope, pulling it into the winch head. In one instant, his hand and arm were drawn in and crushed, flipping him over and out of his boat. With his arm still entangled in the turning winch and his body hanging outside the boat, the near-freezing northern Atlantic Ocean water jolted his senses. The fisherman's survival instinct left him no choice but to try to get back in the boat. With adrenaline pumping through his body, Goodale pulled himself up over the side using his left arm. Because of the way his right arm was twisted, he had to dislocate his already injured shoulder in the process. Staggering inside the heaving boat, he broke the kill switch trying to shut down the winch. "Then I reached for my twine knife by the wheel, cutting through my oil skin to free my arm. I was bleeding quite a bit, but the cold ocean water and the twisting had cinched up the wound." At full throttle, Goodale piloted his boat through the crashing waves to Wells Harbor, where two fishermen aided in bringing in medical help. In comparison to Robert Rainville, a lobsterman a few miles down the coast, Douglas Goodale could consider himself lucky. ➤

In 1998, four days before Robert Rainville turned 18, his lobster trap rope became entangled in the propeller of his 40-horsepower outboard motor. With the prop out of the water, Rainville was reaching far over the stern of his disabled boat to entangle the line. The stern of the boat was heavy with the upended motor and the weight of the fisherman. With one wave, the boat was swamped. Rainville's body was found lodged in an underground reef on the day he would have turned 18. State police divers had traced the fisherman's path by following his lobster trap buoys set in ocean waters out of York Harbor, Maine. Unfortunately, trap rope entanglement in the propellers of outboard-motor-powered lobster boats continues to be a fairly common occurrence.

In happier times at age 14, LEFT, **Robert Rainville III pllots his father's 42-foot commercial fishing boat, *The Flying Frenchman.* Robert Rainville Sr.,** BELOW, **examines the recovered 14-foot skiff in which his son lost his life while lobstering.**

A Risk to Life 28 Times Greater

Today, commercial fishermen face a fatality risk 28 times greater when compared to all other occupations in the United States, making this industry our nation's most hazardous. The toll in injuries and lives lost in the inshore and offshore fisheries along the coast of New England is no different than the record elsewhere in the country. This article will provide an opportunity to learn of the culture, the perils and the possible safety remedies suggested by the men and women at work today in this oldest of New England's trades.

"Down East" in February

Eastport, Maine, in Washington County, is situated farther east than any county in the United States. Washington once boasted of 14 sardine canneries. Today there are none. In this "down east" part of Northern Maine the tides average 18 feet from high to low. Ships from around the world enter Eastport's deepwater harbor in Cobscook Bay to load long logs and brown kraft paper for making boxes and grocery bags. Salmon pens share the shoreline of the bay with the fishermen dragging the bottom for sea urchins and scallops in the winter season. A good number of the fishermen convert their boats for lobstering in late summer.

In the protection of the breakwater, Eastport's commercial fishing fleet lies idle. The boats are rigged for scallop and sea urchin dragging in Cobscook Bay.

While the sardine canneries are long gone, the advent of aquaculture has spawned vast stretches of salmon pens that pump a steady supply of live farm-raised salmon into the local processing plant. Bruce McGinnis owns and operates a 32-foot fiberglass-hulled scallop and urchin dragger called the *Sea Wife*. He refers to Dottie Tucker, his helper, as his sternperson. Tucker is a single mother with three children. McGinnis, like other fishermen in the area, makes time for second jobs. Working as a longshoreman, McGinnis is a busy man. Most Easport fishermen begin their day at about 4:30 a.m. with coffee at the WA-CO Diner, a downtown haven to fishermen. Snow is flying in mid-February as McGinnis warms up the *Sea Wife's* 220-horsepower diesel engine in the darkness and Tucker prepares the fishing gear. Outside the breakwater that shelters Eastport's commercial fishing fleet, it is blowing too much to set the drag in the open waters of Cobscook Bay. In the protection of the boat's heated cabin, the crew steams toward a series of sheltered coves until daybreak.

Upon reaching a sheltered cove, McGinnis dons layers of insulated gear topped with a hooded rain slicker, rubber boots and gloves. He releases the massive chain-linked drag into the sea. As the winch feeds cable through a pulley overhead, the drag sets to the bottom slowing the boat noticeably. After they pass through the cove, McGinnis sets the winch to pull the drag to the stern with its catch of seaweed, mud, starfish, rock and urchins. He positions the drag over a cable constructed on the stern and releases the catch that then crashes to the table. As the drag is dropped into the water, Tucker and McGinnis sort through the muck, collecting urchins while casting off debris. Tucker gathers the urchins of enough size and weight and stows them in the heated cabin. Urchin and scallop dragging operations are dangerous. Cables or headgear can fail sending heavy pulleys and wire cable whipping through the air with a violent release of energy above the sternperson working at the table. Dragging boats can capsize and sink when the drag gets caught on the bottom. The high center of gravity characteristic of some scallop rigs increases the risk of capsize. Entanglement of hands and clothing in unguarded winches is a real possibility when fishermen work in icy and wet conditions on a rocking work platform. Life-threatening events take place with little warning, often dumping the crew into the frigid water before they have had time to put on survival suits.

A Hopeful Sea Change

Douglas Goodale's wife, Becky, "was kind of amazed he went right back to work." During the winter following his accident on the *Barney*, Goodale worked for the Wells Highway Department as a painter and at the local transfer station sorting recyclables. Goodale's frustrations revolve around tasks that require two hands. Surprisingly, having only one arm has not kept him from two seasons of lobstering or from completely overhauling his 35-foot wooden-hulled lobster boat. He has ➤

renamed the boat *Tabbybrat* after his youngest daughter. Severe tendinitis problems are showing up in his good arm. "I know I can't keep doing hull work with it all day." Of his return to the life of a fisherman he says, "I've changed the way I work now. When the lobsters move off shore in the winter, I move home. I call myself a fair-weather fisherman. If I have to hold on, I can't work."

In Eastport, Maine, some of the scallop and sea urchin draggers are refitting the heavy steel headgear above the deck with aluminum replacements. The reduced weight keeps the boat's center of gravity closer to the deck, lowering the risk of capsize. Bruce McGinnis has rigged a further refinement that lowers the main drag pulley to a position less than half the headgear's full height, also lowering the center of gravity considerably. Jeff Smith, who has worked out of Eastport as a sternperson with Butch Harris on Harris' drag boat *The Miss Halie*, has rigged a plastic barrel on the deck fed by warm water from the engine's cooling system to wash the fishing harvest. This is a safer practice than leaning over the side of the boat to wash urchins and scallops. The winch entanglement issue remains a major concern, and little progress has been made toward a practical guard design or toward the acceptance by the fishermen of the need for installing guards on winches. Fishermen mindful of safety will select clothing that reduces the risk of entanglement, and they will remove, for example, drawstrings and decline using excessively loose fitting rain gear. Some fishermen who have been pulled off their boat when entangled in trap ropes have installed gag lines along the side and across the stern that can be pulled to shut down the boat's motor in the event they capture the trap rope as it spools off the winch, effectively eliminating the possibility of the fisherman getting caught in the rope.

No Fisherman is an Island Unto Himself

The lure of independence, of being one's own boss, has a special attraction for fishermen, particularly in New England. Many fishermen who have had near-death experiences have come to believe that without changes in working conditions, the true price of fishing is too high. The changes made by retrofitting their boats, and reducing the risk in their work practices suggest they are no longer willing to sacrifice their own well-being and lives or risk making the lives of those they love painful and difficult. What, after all, is the price of fish?

The changes that Bruce McGinnis and Dottie Tucker have made retrofitting *the Sea Wife* and in their work practices suggest they are no longer willing to sacrifice their own well-being and lives or risk making the lives of those they love painful and difficult.

Near Miss or Collision; *What can make the difference*

One man's knowledge of two narrow escapes and two impacts along the East Coast

by Kathy D. Ruhle, Member, Commercial Fishing Industry Vessel Advisory Committee
James A. Ruhle Sr.,Owner/ Operator of fishing vessel *Darana R*

It is just another hot early July morning in 1998. This summer morning began just as any other when fishing out on the 100-fathom edge east of the North Carolina coast. Today there is one exception. We are surrounded by thick fog with visibility only at 1/4 to 1/8 of a mile. The seas are calm. It is time to set out the gear. The fish hold is more than half full and this day's fishing should fill it the rest of the way up. CAPT Jimmy Ruhle checks his electronics, looks in the radar and makes a mental note to himself, "There is a ship about 8 miles behind us." In this area of the Atlantic Ocean, it is not uncommon to see several ships on the radar at one time. Due to the heavy shipping and Naval traffic in and out of the Chesapeake Bay, the fishing fleet has learned to operate in this area with forever the "watchful eye" for passing traffic.

After studying this ship, determining its course and speed, CAPT Ruhle calls his crew and tells them to prepare to set the gear out. All the time the gear is being set, he keeps one eye one the radar, observing the progress and path of the approaching ship. When the ship is within six miles CAPT Ruhle picks up the hand set of a radio that is always set to monitor other vessels. He begins to call, "Fishing vessel *Darana R* calling oncoming ship, would you advise of your intentions, I am a fishing vessel with my gear out restricting my maneuverability six miles dead ahead of you." Again and again he gives the same transmission with no response from the ship, which is now approaching closer and closer every minute. After constant calling, CAPT Ruhle determines that he is not going to get a response and is wasting precious time. The safety of his crew, consisting of two of his sons and one other are upmost in his mind as well as saving his vessel. If it means cutting his gear loose in order to be able to turn more sharply to avoid collision, then he would do so. Lives cannot be replaced as gear can. He orders his crew to get their survival suits and to stand by, ready to cut the cables that attach the fishing gear to the vessel if necessary.

Knowing a decision has to made quickly, CAPT Ruhle glances upward and asks, "God, help me to turn the right way." CAPT Ruhle knows the ship is quickly approaching. When he sees the "bow wake" of the ship less than 1/4 mile away, he turns his vessel hard to the port. Seconds later, the ship passes the little fishing vessel less than 150 yards on the starboard side. As the vessels pass one another, the captain and his crew gazed into the wheelhouse windows of the massive ship. No one is in the wheelhouse; no one aboard had heard the pleas of the captain.

After the ship sailed out of sight, the crew set about their work. As the captain resumed his normal wheelhouse duties, he could not help but think of another member of his family who had experienced much the same as he and his crew just had: CAPT Philip Ruhle, CAPT Ruhle's father.

As his father was fishing from a 26-foot vessel in the early 1950s, he was enclosed by fog. He could hear the foghorns from a large ship, but he only had a compass onboard, no electronic devices to determine the ship's location. He did not know if the ship could see him but he knew he could not see the ship. Remembering how his father had told the incident, "We were so close to [the] freighter that it ripped off a steel rub rail. We cut loose our nets when we realized the ship was as close as it was. You could hear the steamer, his wash and the propeller turning. Luckily, when we got partway down the ship, the wake the ship made going through the water was enough to push us clear but the two vessels were so close that the discharge from one of the ship's engines almost sank us." Their lives and his vessel were spared.

In a situation like this, blame for a near miss cannot be made. Technically, possibly he should not have been fishing so close to the shipping lanes but, if the fish are in this area and the objective is to make a living by catching fish, where else would you be?

As CAPT Ruhle continues to think about the near miss he had just experienced, and the one his father had survived many years ago, he also thought of those who encountered a direct hit.

CAPT Ruhle thought about the winter in the late 1960s when he worked with CAPT Willie Etheridge Jr., a fisherman known as one of the best up and down the East Coast. He had learned a lot from this quiet man over the years.

Seconds later, the ship passes the little fishing vessel less than 150 yards on the starboard side. As the vessels pass one another, the captain and his crew gazed into the wheelhouse windows of the massive ship. No one is in the wheelhouse; no one aboard had heard the pleas of the captain.

On a clear star-studded night in January 1973, CAPT Etheridge was searching for schools of fish aboard his 78-ft. trawler, *Wayne Laurin,* just eight miles north of the Cape Hatteras light tower and 11 miles off shore. This is an area where it is very common for passing shipping traffic to see large fleets of fishing vessels during the winter months. He was working with a small fleet of fishing vessels. When catches became smaller, some of the vessels moved farther north, looking for larger schools. CAPT Etheridge, as well as a few other captains, decided to remain in the area. He searched for a while and then decided to lie down, leaving his son at the wheel to look for fish in the general area. Both CAPT Etheridge and his son, Willie, had served in the U.S. Navy and knew the duties of being in charge. After surveying the area on the radar he left the wheelhouse. He climbed in his bunk for a few hours rest. A few minutes before 10 p.m., he was awakened as he was being pitched out of his bunk; the *Wayne Laurin* was slammed just ahead of the forward mast and cut in half by a merchant ship.

CAPT Etheridge jumped up and ran out to find that his vessel was indeed cut in half and sinking fast! He could see remnants of the crushed bow of his vessel as well as gear that had been stowed in that area floating ➤

in the water. He went back inside, told his crew of four to put on their life jackets, prepare to launch the life raft and to get in it as soon as it cleared, for they were going down fast. He stayed in the wheelhouse, calling the ship that had struck them, begging whom ever might be on watch, "Please come back to rescue us, we are sinking," but it was to no avail. A tanker passing outside of the collision did answer his call and told him that he had seen the freighter hit the fishing vessel and also was watching that merchant vessel as it continued to move south. CAPT Etheridge asked the gentleman aboard the tanker to please follow the ship so he would know where it went into port. The captain stayed in the wheelhouse calling for help until he was sure he had reached someone to rescue them. Another fishing vessel, *Mitzi Kay*, heard CAPT Etheridge's calls for help and came as quickly as the crew. Moments after he got into the life raft with his crew, the stern section of the *Wayne Laurin* sank beneath the surface of the ocean, her galley lights still shining. The *Mitzi Kay* soon rescued the captain and his crew, and brought them to shore.

The docked fishing vessel *Darana R*, ABOVE**, which narrowly survived a collision three years ago.** ON LEAD PAGE **The trawler *Wayne Laurin*, before it was cut in half and sunk in 1973 because of a neglectful ship operator. Photos courtesy the Ruhle family.**

As CAPT Ruhle glances at his watch, he realizes that it is time to haul back, time to put his thoughts aside and to get back to the work at hand. Just before he calls his crew, he thinks, "I wonder if the next fishing vessel incident of this kind will be a near miss or a collision."

The question was answered just 11 months later when the 56-ft. vessel *Frisco* was steaming back to port on a calm foggy night in June 2000. A merchant ship about 40 miles east north east of Norfolk, Virginia struck this vessel and it sank immediately. The crew of four was thrown into the sea. The following day a passing sailing vessel that was on its way to Rhode Island rescued three of the crew. The fourth man, the captain of the vessel was last seen drifting off away from the remaining wreckage, bleeding severely. He was never seen again. It is presumed that the *Frisco* was struck from behind because there was no warning according to the survivors. There was no time for a distress call to be made, and the *Frisco*'s EPIRB failed; therefore no one knew of the collision that had happened between the two vessels since the ship did not report it. The merchant vessel apparently was not aware of the collision due to the fact that it never altered course or speed as related by the survivors.

Although near misses are believed to be rare, there is no real way to know just how many occur, because very few, if any, are ever documented. Since collisions must be and are documented, thorough investigations are made from which fault can be determined.

It is customary for communications to be established between fishing vessels and merchant ships allowing for course changes or appropriate measures to be taken to avoid any dangerous situations. It is common for merchant vessels to alter courses around areas where fishing vessels are present. Both parties are equally responsible for taking all necessary measures to avoid any kind of situation that could cause the loss of lives and/or property.

Only a very small percentage of merchant vessels are believed to not follow this precautionary procedure. One factor that may cause this is the strict schedule the ship is ordered to follow. Altering course may add time to the ship's voyage and possibly put the ship behind its scheduled arrival. This becomes an issue of safety versus schedules, in which safety is often compromised. Another may be whether or not the person on watch is present in the wheelhouse on either vessel. If one of the vessels has no one present, the other vessel's operator is on his/her own to determine what the best course of action must be.

Each time the *Darana R* approaches the dock in Hampton, Virginia, CAPT Ruhle says a word of thanks for another safe trip. Even though there are near misses and collisions he still feels that commercial fishing is the occupation for him. "Being a third generation fisherman, my wife also comes from a family of generations of fishermen. I have three sons who have been involved in the commercial fishing industry and two daughters who will make a trip every chance they get. This makes me feel that being a commercial fisherman has and always will be my way of life and I like it that way", says CAPT Ruhle.

Unfortunately, it should be noted that even with the most thorough fishing vessel safety training programs and the best available safety equipment, accidents can and will still happen; hopefully not as often. However, equipment and training may be rendered useless in the few incidents that occur without advance warning.

Saving Lives is a Shared Success

by ENS Ken Morton, Seventh COast Guard District, CFVS Coordinator

Shortly after 3 a.m. on March 11 of this year, the four-man crew of the 75-foot shrimp trawler *Miss Marilyn Louise* found themselves in a situation that fishermen fear worst. Eleven miles from shore, their boat was taking on water fast, with no way to control the flooding. The water was coming in through the engine room and had risen to the point that it was impossible to plug the source. Wisely, and with little other option, the crew abandoned ship into the inflatable life raft with their lifejackets on and their Emergency Position Indicating Radio Beacon (EPIRB) in hand. Before abandoning ship, CAPT Tony Carl Robbins, was able to transmit a mayday distress broadcast over the vessel's VHF radio. Fortunately the vessel's radio had a backup power supply that allowed it to continue working even when the rest of boat's battery-supplied electricity had failed.

Having received this distress call, the Coast Guard Cutter *Joshua Appleby* began steaming towards the direction of the broadcast while a Coast Guard jet searched for the source of the EPIRB. The crew, adrift in their life raft, launched two red flares that could be seen for several miles against the dark sky. The *Joshua Appleby,* as well as the commercial freight ship *A. V. Kastner,* both saw the flares and proceeded towards the apparent source. The 600-ft. *A. V. Kastner* was first to arrive on scene where they found the crew in the life raft near the capsized fishing vessel. Due to the diligence and response of both the Coast Guard and the *A. V. Kastner*, all men aboard the stricken vessel were safely recovered and returned to safe harbor. *Miss Marilyn Louise* eventually sank in 1,000 feet of water, but the story behind the successful rescue of these fishermen is only half told.

If this had happened prior to September 26, 2000 this incident might have ended much differently. On that day, Coast Guard CFV Examiner CWO Lionel Campbell and Auxiliarist Jim Whitesell conducted an exhaustive dockside safety exam of the *Miss Marilyn Louise*.* During the comprehensive exam they noted numerous safety issues that would have severely hindered any chance for a successful rescue, had this incident occurred then. Many of the items that were directly responsible for saving the lives of the fishermen were in dire need of maintenance, repair, or replacement. These discrepancies included lifejackets, flares, and the life raft that they depended on that morning on March 11. Moreover, if Whitesell and Campbell had not illustrated to the vessel's owner the importance of a back-up power supply for the VHF radio, it is questionable whether the crew would have been able to make that crucial distress call. Notwithstanding the EPIRB signal, that mayday call was the first bit of information that the Coast Guard had to direct rescue assets to the general location of the foundering boat. By advising the vessel's owner to replace the expired flares back in September, the Coast Guard examiners ensured the maximum probability that those flares would work properly, as they did. Two days later, the owner of the *Miss Marilyn Louise* corrected every outstanding item on the Coast Guard safety work list. Whitesell and Campbell re-examined the vessel and issued a Commercial Fishing Vessel Safety Program decal.

Through prevention and education, our Coast Guard boarding officers and dockside examiners save lives everyday. Whether first on scene during the climax of a dramatic rescue at sea, or during the relative calm of a safety boarding or exam, all of our Coast Guard men and women share in the success when mariners' lives are saved.

** Coast Guard safety exams are conducted free of charge to commercial fishermen and carry no punitive measures for discovered safety deficiencies. Fishermen are encouraged to request voluntary dockside exam by contacting the Coast Guard commercial fishing vessel examiner in their area.*

USCG photo of the shrimp trawler *Miss Marilyn Louise* taking on water before she sunk.

ON-DECK DANGERS IN THE ALASKAN COMMERCIAL FISHING INDUSTRY

by Brad Husberg, Jennifer Lincoln, George Conway
Alaska Field Station, National Institute for Occupational Safety & Health, Centers for Disease Control & Prevention, Anchorage Alaska

Stern view of a fishing trawler on a normal season fishery. USCG photo.

BACKGROUND

The working deck of a fishing boat can be a particularly hazardous working environment. Not only are workers exposed to the elements, but the deck can be a very unstable work platform as it is constantly moving, and it is often also congested with machinery and fishing equipment. In addition, it may be made slippery by being covered by ice, water, fish-slime, and oil. In its 1991 study on fishing vessel safety, the National Research Council noted, "The apparent high incidence of workplace accidents suggests inadequately-designed safety features in machinery, deck layouts, and fishing gear."[1]

Surveillance for work-related injuries has identified the commercial fishing industry as contributing high numbers of fatal and severe non-fatal injuries in Alaska.[2, 4] Most of the 162 Alaskan commercial fishing fatalities from 1991-1998 were attributed to the loss of the vessel due to capsizing or sinking. However, a large proportion of these deaths (38 percent) did not involve such an event. Rather, they were attributed to an injury occurring on deck, usually involving machinery/fishing equipment including being struck by an object, drowning after falling overboard, or being pulled overboard because of entanglement in fishing gear. Being caught in gear such as a net or line accounted for 33 percent of the fatalities associated with falling overboard.[3] From 1991-1995, commercial fishing lead all industries in Alaska with the highest number of reported hospitalized work-related injuries in the Alaska Trauma Registry (ATR). These were primarily caused by machinery and injuries due to falls.[4] The purpose of this paper is to evaluate non-fatal injuries on board fishing boats.

METHODS

The ATR is a population-based trauma registry that collects information from hospital medical records of all acute care hospitals in Alaska. This database contains information on injured persons who are seen in a hospital emergency department in Alaska. Also, these patients have to either be admitted to a hospital, transferred to another hospital for admission, or declared dead in the emergency department. Trauma registries are a unique source of injury surveillance and prevention data; demographics, geographic information, disability, medical cost, payment source, cause of injury, discharge diagnosis, and severity scoring, are only a few of the examples of data that are collected.

RESULTS

The ATR contains information on injuries beginning in 1991 through 1998. From 1991 through 1997 commercial fishing had the highest number of injuries. However, by 1998, the construction industry (621) had overtaken commercial fishing (587) as the industry with the highest annual number of hospitalized injuries. Commercial fishing had an average annual hospitalized injury rate of 4/1,000 workers, ranking third behind the forestry (18/1,000) and construction industries (6/1,000).

When evaluating cause of injury, we found that machinery (187) was the leading cause of nonfatal injuries in the commercial fishing industry. Falls (149) ranked a close second followed by being struck by an object (98). The ATR's injury description narrative field showed that falls most ➤

often occurred into holds, through open hatchways, and as a result of slipping on ladders and gangways. Injuries from machinery often involved equipment unique to this industry. "Crab pots" (baited cages weighing up to 800 lbs. empty and maneuvered by cranes) and a "crab pot launcher" were listed in the records as factors in a number of injuries. A crab pot launcher is a hydraulic lift that raises and tilts the pot over the top of the gunwale where it slides into the water. Powerblocks, cranes, bait chopper, and winches were also repeatedly mentioned. The most common types of injuries were fractured bone (279), open wound (73), and burn (29). Extremities were the body regions most often injured with 184 to the uppers and 171 to the lowers. The third most common body region mentioned was spine with 35.

A fisherman lifts an empty crab pot into Alaskan waters. The crab pot is attached to the crab pot launcher by the hook in the far left corner. Photo courtesy Husberg, Lincoln & Conway

DISCUSSION

Contributing factors in commercial fishing deaths vary from nonfatal injuries to workers in this industry. As mentioned previously, most commercial fishing deaths result from the loss of a vessel due to capsizing or sinking. However, through the examination of ATR data we can see that most nonfatal injuries occur while working on the vessel (either on deck or below), from machinery on deck, falls, and/or being struck by objects.

The causative factors for Alaska commercial fishing-associated fatal and nonfatal injuries are complex. Gear type, fatigue, and environmental conditions also contribute to the severity, as well as the frequency, of occupational incidents.

Many of the injuries occurred while working in the proximity of a crab pot launcher either while fishing for crab or cod. Recommendations to fishermen for the prevention of these injuries could come from safety and machine-guarding lessons learned in general industry. For example, painting a yellow line for a "safety zone" around the perimeter of the crab pot launcher could serve as a reminder for the fishermen to stand behind the line while the launcher is in motion. Painting the launcher itself a bright color could help fishermen to see the launcher under low light conditions and be aware of its movement. Many launchers have an entire side, up to eight feet, that rests on the deck when it is not in motion. The area where the launcher comes in contact with the deck can provide a crushing point for feet. Welding two 4-foot by 4-foot by 4-foot bumpers along the edge of the launcher could decrease the potential crushing area from 8 feet to 8 inches.

Even though attempting to control a heaving deck in rough seas could be futile, there are new types of deck surfacing now available that could provide for surer footing and reduce the potential for falls. Also using bright color and glow-in-the-dark tape or paint to define openings in the deck could help increase their awareness and prevent falls.

The impressive progress made during the 1990s in reducing mortality in fishing-related incidents in Alaska has occurred largely post-event, primarily by keeping fishermen who have evacuated capsized or sinking vessels afloat and warm (using immersion suits and life rafts), and by being able to locate them readily, via electronic position indicating radio beacons (EPIRBs). All of these regulations required by the Commercial Fishing Industry Vessel Safety Act (CFIVSA) were implemented during 1990 through 1995. However, additional attention should also be given to worker safety around deck machinery, an area that has not been adequately addressed with current safety regulations. Efforts are needed to better define the relationship between the vessel, fishing equipment and the worker. The NIOSH Alaska Field Station mounted an engineering design project in October 2000 to address some of these issues.

CONCLUSIONS

It would be useful to continue to look at the causes of these deck injuries and develop strategies to prevent them and to learn about safety practices that some crews already have in place that make the operation safer. This information could be utilized and promoted to other fishermen, captains, and vessel owners to increase awareness of the problem. These ideas can then be personalized and individually implemented with the intent to increase safety awareness and prevent these types of injuries.

There is an urgent need for improving the safety of fishermen in this highly mechanized workplace. Examination of the deck environment surrounding the deployment and retrieval systems (including the use of cranes, "power blocks," pulleys, winches, lines, nets, crab pots, and crab pot launchers) of fishing equipment from a mechanical and safety engineering perspective is needed. Additional areas to focus on include machine guarding, separating workers and lines, and fall prevention. Through successful application and promotion of new technological innovations and interventions, the number of fatal and non-fatal injuries in this industry should decrease.

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2. Current Intelligence Bulletin #58: Commercial Fishing Fatalities in Alaska, Risk Factors and Prevention Strategies. National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 97-163.

3. Lincoln, JM, Conway, GA, Preventing commercial Fishing deaths in Alaska, Occup Environ Med 1999; 56: 691-695.

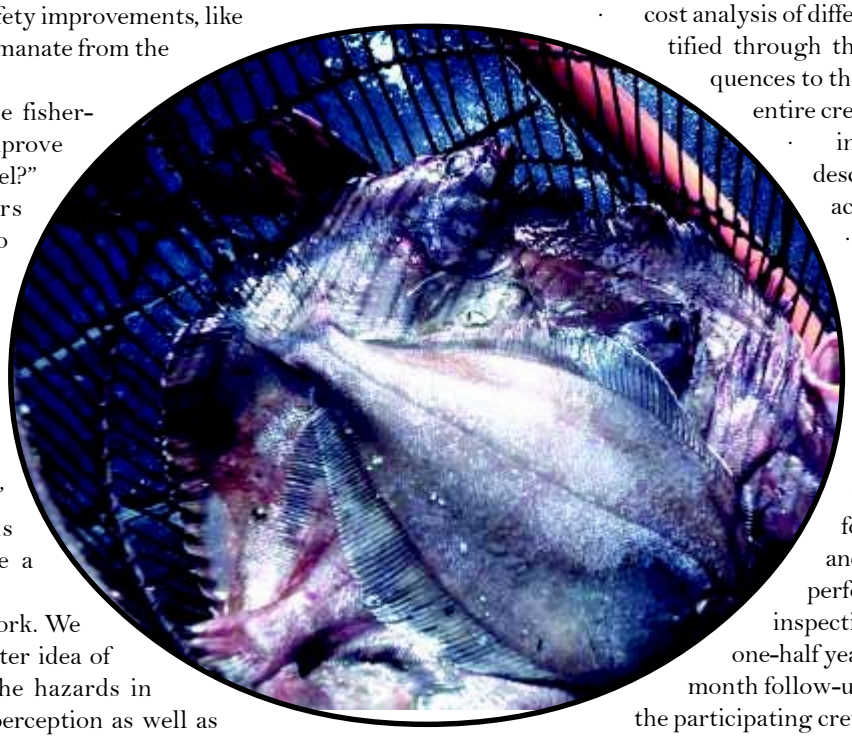
4. Husberg BJ, Conway GA, Moore MA, et al. Surveillance for Nonfatal Work-Related Injuries in Alaska, 1991-1995. American Journal of Industrial Medicine. 34:493-498 (1998)

Finding Ways to Support Safety in Fishery

by Marianne Törner, Associate Professor, National Institute for Working Life, Göteborg, Sweden

After 10 years of research and development work, where the approach always had been very "field-wise," as well as educational work in ergonomics and safety in Swedish fishery, I thought I might dare some retrospect.

Developing generic solutions to common problems had simply not been very effective in terms of actual implementation, even if the solutions were developed in close cooperation with the trade and a prerequisite was that the suggested solutions must always be within cost. Presenting ergonomics principles and practical solutions at courses for fishermen did not much improve things, although participation to the courses was high. In parallel with technical development work, efforts must be made to improve the methodology to promote implementation of such solutions. Safety improvements, like any change process, must emanate from the users-to-be.



We started asking the fishermen, "Why don't you improve safety onboard your vessel?" Some typical answers emerged: "It costs too much," and, "There are not really that many accidents. At least not here." We continued, "But what about the fellow who got his hand severely damaged on vessel such and such?" The answer here was often: "Well, he made a foolish mistake!"

This led us on in our work. We realized we must get a better idea of how fishermen perceive the hazards in their work, and how this perception as well as actual activity in safety work, is related to the perceived ability to influence working conditions. We also decided that in order to obtain credibility we must be able to show that accidents, also severe ones, are common in fishery, that the costs to the victim as well as to the rest of the crew are high, and that preventive measures often require modest amounts of money and should be viewed as investments rather than costs. Last, but not least, that risks identified through records of accidents can be directly related to hazardous conditions on board the fishermen's own specific vessels. These plans resulted in two research projects with the aim of developing and evaluating methods to increase implementation of safety measures and enhance activity in safety work in fishery. The first project comprised the following parts:

- analysis of serious accidents in Swedish fishery during a 12-year period, giving the frequency and characteristics of such accidents, as well as the outcome, in terms of sick-listing and disability;
- cost analysis of different types of accidents identified through the accident analysis; consequences to the individual as well as to the entire crew;
- inventory of safety measures: description, costs and accessibility; and
- visits and participatory safety inspections on 101 fishing vessels and presentation to the crews of the data acquired in points above.

The effect of the method was evaluated through two telephone follow-ups of the 101 visits and safety inspections. One was performed six months after the inspections and the other, two and one-half years after inspection. The six-month follow-up showed that 80 percent of the participating crews had attended to deficiencies identified at the safety inspections. At the two and one-half year follow-up 78 of the 101 vessels were still available. For those, the fishermen stated that out of the 123 measures taken at the six-month follow-up, 118 were still in use. Among those, the fishermen were entirely satisfied with the function of 110 and partially satisfied with 16. Since the six-month follow-up, 45 of the 78 vessels had taken measures against additionally one or more safety deficiencies identified at the safety inspections. All ▶

in all, another 85 such deficiencies had been dealt with. Supplementary to this, another 49 measures to improve safety or ergonomics on board, not listed at the inspection, had been taken. All together 60 vessels had taken measures within either (or both) of these categories. The methodology for supporting implementation of preventive safety measures based on direct contact and a high degree of participation by the users was found to be effective both in increasing implementation of safety measures and in long-term use of these measures in fishery. The approach seemed to be to a certain extent self-generating since planned measures to a substantial degree actually became implemented, project participants expressed increased observance to risks at work and further measures were being planned. The possibility to discuss safety with a person from the "outside" but with profound technical knowledge as well as knowledge about the conditions in fishery was also expressed by a majority of the participating fishermen.

The second project encompassed two elements. One was a questionnaire study of 92 fishermen with the aim of acquiring in-depth knowledge of fishermen's perception of risks in connection to hazardous situations, of the perceived possibility to improve safety in these particular situations through technical measures and changed working methods, and of the fishermen's perception of their personal ability to influence safety. We wished to explore the role of these psychological factors in relation to activity in safety work and accident experience. This information was to serve as an empirical basis for the second part of the project. This encompassed the formation of two discussion groups with two to three fishing crews in each, two discussion leaders and an occupational health and safety (OHS) engineer. In all, 11 fishermen participated. The groups met six times during ten months. Between meetings the fishermen were instructed to log near-accidents and accidents in a diary. At the meetings, these events were related and analyzed in a structured manner in order to identify the basic causes of events, releasing factors, etc. The events and possible preventive measures were then discussed within the groups. Effects of the intervention were evaluated through a follow-up questionnaire (the same as used initially), and subsequent interview.

The initial questionnaire study of the 92 fishermen showed that activity in safety work had no correlation to risk perception but was positively related to confidence in risk control through technical measures and changed working methods. The follow-up questionnaire study showed a decrease in perceived manageability of risks after the intervention, but also a tendency towards increased activity in safety work. A longer intervention period may have been beneficial. There was a tendency towards decreased sense of fatalism and fearlessness after the intervention. In the follow-up interview, all but one participant stated an increased interest in safety issues as a result of the intervention. Seven fishermen stated a higher risk perception due to the project. Thirty-four of 43 reported accidents/near-accidents had a basic cause of a technical character. Weather conditions and deficient routines were common releasing factors. Common near-accidents were often ignored. More uncommon near-accidents were usually noted as were those where dramatic consequences were foreseeable had the event resulted in an accident.

The study design based on regular discussion group meetings worked well in such a way that those participants who started coming to the meetings also continued to attend. The group members stated that they had benefited from participation and that their attitude towards safety had been influenced in a positive way. Few actual measures were, however, taken aboard the boats during the intervention period. The follow-up interview showed that the content of the meetings was perceived as relevant, technical support was offered to the required degree, and the possibilities to relate to other crews were appreciated. The outcome of the intervention could have been better with more crews participating in the discussion groups. The fishermen wished to continue meetings in discussion groups under the guidance of the OHS services. This places a responsibility on the OHS organizations to develop their services in this direction.

PREVIOUS PAGE **USCG photo.**

Three fishing vessels *ABOVE* head to sea. Photo by PA2 Patrick Montgomery.

observing safety

by ENS James Stellflug,
Fourteenth Coast Guard District, CFVS Coordinator

In Hawaii, the U.S. Coast Guard fishing vessel safety team partnered with the National Marine Fisheries Service and Pacific Ocean Producers to train 40 newly-hired National Marine Fisheries Service observers during two different sessions in Honolulu Harbor. The observers were given hands-on training as well as fishing vessel familiarization and safety awareness.

Recently in Hawaii, a federal court ruling required either 20 percent or 100 percent observer coverage on Hawaii fishing vessels depending on the area being fished. The ruling was intended to reduce the impacts to sea turtles by the Hawaii longline fishery while NMFS prepared an environmental impact statement, which had a deadline of April 1, 2001. It also required NMFS to increase the number of observers in Hawaii from two to 40. This prompted action to ensure that basic safety training was given to the newly hired observers. The training consisted of donning immersion suits, life raft entry, igniting flares and using a fire extinguisher. In the case of vessel flooding, a Coast Guard pump may be provided by an aircraft or cutter. Personnel often do not accompany the pumps, therefore, it is the responsibility of the crew to operate them. The trainees were given a USCG pump and were tasked with de-watering Honolulu Harbor. Although the pump ran out of gas before the harbor emptied, valuable experience and knowledge was gained.

A National Marine Fishing Fisheries Service observer is trained on how to use a fire extinguisher ABOVE, and a survival raft BELOW. USCG photos.

Observers can be placed in critical situations, which require evasive actions. Through safety training and familiarization with fishing vessels, the observers increase their level of safety as well as becoming an asset to the crew if an emergent situation arises. There is no typical observer, as their backgrounds vary from seasoned mariners to recent college graduates with little or no seagoing experience.

In recent Hawaii observer history, two instances come to mind. The first being uncontrolled flooding on the vessel *Seabird*. In this case, the observer, Hugh Kim, assisted in de-watering the flood in the fish hold and was solely responsible for making the critical mayday call. The vessel was not saved. However, due to the observer's assistance in de-watering and radio procedures, the vessel remained afloat until assistance vessels arrived. The observer was a definite asset in this case as the crew was Micronesian and spoke only broken English. Along with making the mayday call, the instructions in the Coast Guard aerially dropped pumps were in English and only readable by Kim. Another incident involved the fishing vessel *Red October*. The vessel was struck by a 50-foot rogue wave and washed overboard four crewmembers and the NMFS observer Eric Sandberg, who stated, "From my experience, I would stress the importance of not getting complacent in our respect for the power of the ocean. To always plan for emergency situations before you get into one, and to know and understand the proper procedures for using your emergency equipment. The U.S. Coast Guard was there when I needed them, I will always return that favor."

Crucial incidents are not uncommon on fishing vessels. For this reason it is extremely important that each member on board a vessel is able to assist in the event of an emergency situation, to save their life and possibly others. The Coast Guard, NMFS and the fishing industry will continue to partner and ensure that safety is observed by all onboard commercial fishing vessels.

OPERATION SAFE CRAB 2000

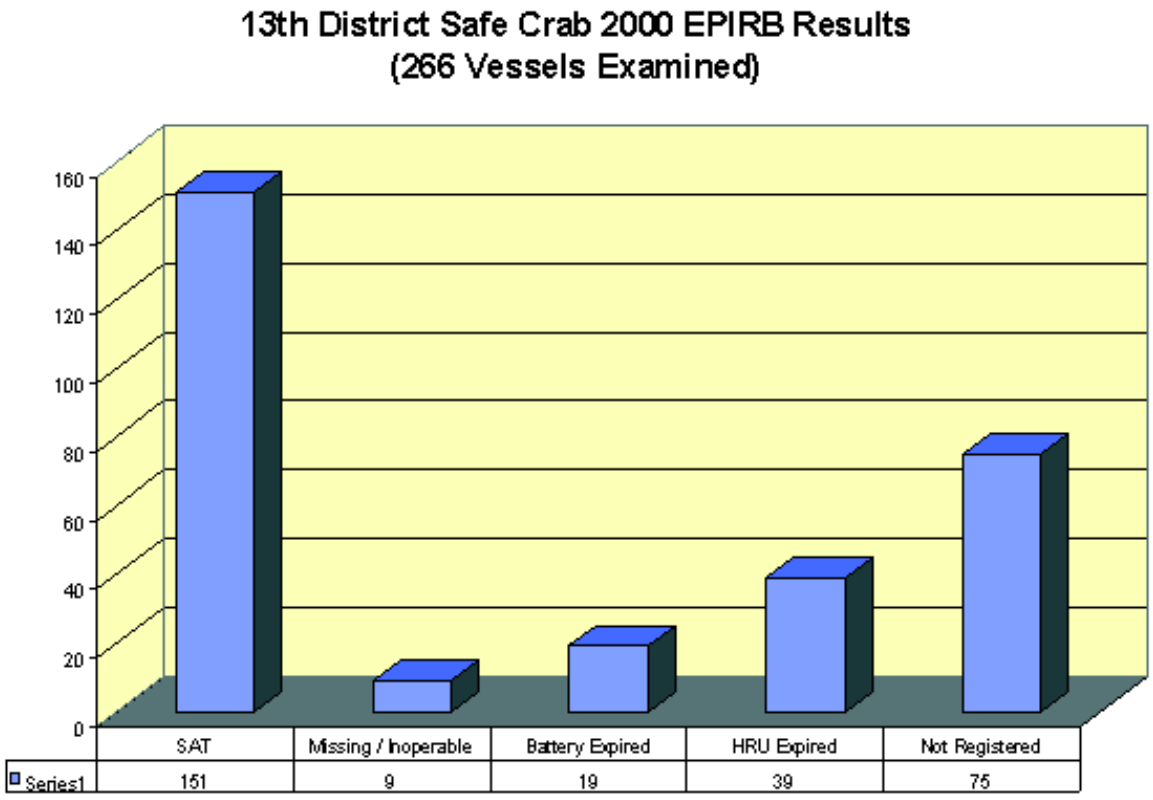
by LTJG Marianne Gelakoska, MSO Portland, OR, CFVS Coordinator
LT Chris Woodley, Thirteenth Coast Guard District, CFVS Coordinator

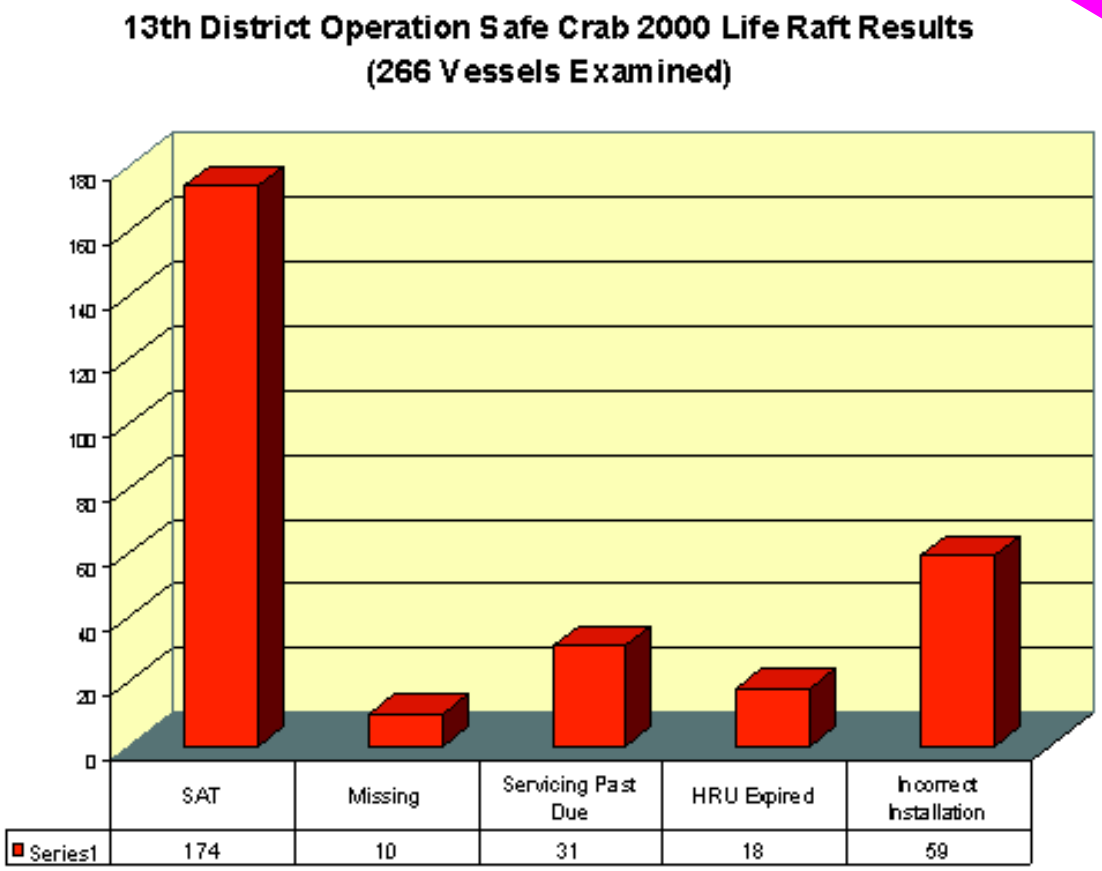
INTRODUCTION

The winter Dungeness fishery has experienced a large number of fatalities and vessel losses along the Oregon and Washington coast. From 1996 to 2000, six fishermen have perished and seven vessels have been lost. This has accounted for 21 percent of the fatalities in the 13th District since 1996. This poor safety performance is likely due to a number of factors: operating in poor weather during the November to January time frame, carrying a large deck load in the form of 100 pound crab pots, and missing or improperly installed lifesaving equipment. Due to the high incidence of loss of life and property, the winter Dungeness fishery has been identified as a high-risk fishery.

In support of Coast Guard Pacific Area Command's (PACAREA) Operation Safe Return, Marine Safety Office Portland, Group/Air Station Astoria, Group/Air Station North Bend and the 13th District Fishing Vessel Safety staff jointly developed an "At the Dock" enforcement and education outreach initiative, dubbed Operation Safe Crab 2000. This operation was designed to reduce loss of life and property in the 2000-2001 Washington and Oregon Dungeness crab fishery. The goals of Operation Safe Crab 2000 were to board 30 percent of the crab fleet and carry out the following activities:

- **Conduct Spot Checks on Primary Lifesaving Equipment**: MSO & group personnel would verify carriage of primary life saving equipment (life rafts and Emergency Position Indicating Radio Beacons) and ensure the equipment was installed properly.
- **Provide General Safety Training**: MSO & group personnel would conduct educational presentations using the damage control simulator, demonstrate operation of de-watering pumps, review mayday procedures, don immersion suits, and ensure that stability issues were discussed with each vessel representative.
- **Prevent Unsafe Vessels from Getting Underway**: Vessels with serious safety discrepancies would be informed that unless their deficiencies were corrected prior to getting underway, their vessels would be held at the dock using applicable Coast Guard authority.





SCOPE OF ACTIVITY

To accomplish the goals of Operation Safe Crab 2000, it was necessary to deploy four three-person teams along the Oregon and Washington coast for two five-day periods during November and December 2000. Operation Safe Crab planners divided the Oregon and Washington coasts into three separate zones and focused on those ports where historically, significant amounts of Dungeness crab were landed. In addition to these three "compliance teams," a separate education/outreach team was dispatched to provide damage control and vessel stability training, EPIRB testing, and voluntary dockside exams along the coast.

The scope and intent of Operation Safe Crab 2000 was heavily advertised to the crab industry one month prior to the activities to reduce the element of surprise and to let the industry know in advance that there would be serious consequences if vessels failed to comply with basic fishing vessel safety regulations.

BOARDING RESULTS

During a nine-day period, the compliance teams boarded 266 of 450 (60 percent) of those vessels that were registered for the winter Dungeness crab fishery.

The compliance teams recorded the following results: only 151 of 266 (57 percent) of the vessels checked had EPIRBs that were in satisfactory condition. The remaining EPIRBs had problems; most commonly the device was not registered. This was corrected on the spot.

A similar assessment was made of the vessel's life rafts. Of the vessels boarded, only 174 of 266 (65 percent) of the rafts were installed and serviced properly. Fifty-nine (22 percent) of the life rafts examined had been installed incorrectly and would not have floated free in an emergency. These deficiencies were all corrected on the spot. Those vessels that either had a missing life raft or EPIRB, or if either of those items were out of service for more than a year, were required to correct those deficiencies prior to getting underway. All but one vessel corrected the deficiencies without the need for a Captain of the Port Order.

CONCLUSION

Operation Safe Crab 2000 exceeded all goals set forth by organizers. Inspection of safety equipment, correction of deficiencies, education through outreach, and judicious use of Captain of the Port Authority were successfully combined to improve safety in the 13th District's highest risk fishery. Following the end of the season this year there were no fatalities in the fishery. One vessel was lost due to fire, and the crew was able to safely evacuate the vessel using their survival suits, life raft, and EPIRB. This vessel was checked at the dock and found to be in satisfactory condition during Operation Safe Crab 2000. Giving the industry advanced notification and ensuring that those conducting boardings were reasonable and professional in their enforcement practices were key factors to the success of this safety initiative, and resulted in a true "Win-Win" situation for the commercial fishing industry as well as the Coast Guard. This operation will serve as a blueprint for future initiatives in other fisheries.

COAST GUARD AUXILIARY COMMERCIAL FISHING VESSEL EXAMINER

by Michael M. True, Division Chief, Commercial Fishing Vessel Safety Program, USCG Auxiliary

In 1992, the U.S. Coast Guard Auxiliary answered a call for assistance from the Coast Guard to oversee the Commercial Fishing Vessel Safety (CFVS) Program. In the course of time, Coast Guard Auxiliary recruitment has gradually enhanced the program with qualified vessel examiners, providing striking results in the number of vessels examined year after year.

The Coast Guard Auxiliary is a part of the overall plan to carry out the regulations resulting from the Fishing Vessel Safety Act of 1988. The plan calls for the Auxiliary to conduct voluntary dockside examinations of commercial fishing vessels. The voluntary dockside examination is not a law enforcement activity. The purpose of the program is to verify compliance with all of the applicable Federal regulations in a non-adversarial manner.

A Commercial Fishing Vessel Examiner typically wears the uniform shown above. All qualified Auxiliary examiners have credentials identifying their position and are the only persons in the Auxiliary authorized to interact with CFV owners in doing a dockside examination. USCG photo.

The Auxiliary has played an instrumental role in sharing their *Lessons Learned* fact sheets with fishermen all over the continental United States. These lessons are actual excerpts from experiences and related occurrences happening in varied areas of the industry. By sharing this information locally, knowledge is increased with an aim at substantially reducing fatalities. Examiners present these facts in terms of understanding the "cause and effect" relative to local working conditions. Their emphasis on prevention is placed in the hands of each vessel owner who has the ability to alleviate fishing tragedies.

One of the most successful elements of the existing CFVS Program is the voluntary dockside examination initiative. In 1998 and 1999, several vessel loss casualties with high potential for loss of lives were transformed from near-certain disastrous events into life saving success stories as a direct result of the efforts of Auxiliary CFV examiners. In addition to conducting CFV exams, Auxiliary examiners also educate fishermen about survival equipment maintenance and use. For example, they demonstrate the correct way to don a life jacket and/or survival suit; the procedure for calling in a mayday; proper method of launching a life raft; check out of the emergency position indicating radio beacon; storage and use of the fire extinguisher, and ways of conducting drills appropriate to the size of the vessel. On several occasions, fishermen used this education during actual emergencies that resulted in their lives being saved. The Coast Guard firmly believes that dockside vessel exams are key to improving CFVS and has requested that the Auxiliary increase their support of this important initiative.

An operation worth noting took place last year. In June 2000, the Coast Guard Auxiliary partnered with the Marine Safety Office, Anchorage, Alaska, to conduct fishing vessel examinations in the Bristol Bay area of Western Alaska. This very successful operation was achieved by six Auxiliarists, augmenting the six active duty members from the Marine Safety Office in a two-week period. More than 300 vessels were boarded with a total of 262 examinations conducted. Many of these fishing vessels were examined for the first time. Training was also conducted in the use of life saving equipment, fire fighting equipment and basis damage control. Many skippers and crews had never even discussed emergency operations and procedures. The typical response was, "We will jump on the next boat if a problem arises." The easiest crews to work with, for the most part, were the Native Alaskans. Many times, they would send one of their crew to procure the needed items and they corrected any deficiencies discovered as quickly as possible while the examination was being conducted. After a few days on location, it was not uncommon for the teams to be approached by the fishermen to talk about examinations and safety equipment.

Since CFV exams are conducted on vessels at the convenience of commercial fishermen, the Coast Guard recognizes the need to establish a trust relationship between examiners and commercial fishermen. Without established trust and mutual respect, fishermen will not likely allow CFV examiners to exam their vessels. So how does one recognize an examiner? They might generally be seen in a uniform consisting of a polo type shirt marked with CFV Examiner identification, worn with working blue trousers. All qualified Auxiliary examiners have credentials identifying their position and are, as such, the only persons in the Auxiliary authorized to interact with CFV owners in doing a dockside examination. One unique characteristic about a Coast Guard Auxiliary examiner is their ability to "walk the walk and talk the talk". There are other volunteer Auxiliarists, called dock walkers, who distribute safety brochures and up-to-date information concerning the Commercial Fishing Safety Program, but they are not involved with examinations. When commercial fishermen are greeted by the dock walkers, they can readily be given the name and telephone number of local examiner contacts.

Last year 140 Auxiliary examiners completed more than 1,300 examinations. This number represents approximately 25 percent of the total exams performed by the Coast Guard and Coast Guard Auxiliary combined. The commercial fishing fleet size is more than 100,000 vessels. Traditionally, Team Coast Guard has examined approximately 7,000 to 8,000 vessels each year. This is a good indication that our work has just begun. The Coast Guard Auxiliary National staffing has established Branch Chiefs in strategic locations to assist in recruiting and training, along with provisioning technical expertise. The program is expanding with the infusion of Assistant Branch Chiefs to help accelerate an aggressive program of recruitment to meet the demands of today. Our objective is to save fishermen's lives.

OUR MISSION IS SAFE FISHIN'

Snapshots in Time

by Ted Harrington, First Coast Guard District, CFVS Coordinator

If we do not learn from history, we are doomed to repeat it.

Inscribed on the arch of our National Archives Building in Washington D.C., are the words "THE PAST IS PROLOGUE". These words were appropriately chosen because this building houses the documents and printed deeds of the individuals who molded this country.

The same precepts of this statement can apply to fishing vessel safety. The Northeast United States can be considered the prologue of vessel safety in this country. A quote from perhaps the most famous introduction to any piece of American literature captures the focus and intent of this paper. "*Moby Dick*" begins with the words "Call me Ishmael." As Ishmael signs on for the voyage, the captain asks "Dost know nothing at all about whaling, I dare say—Eh?" "Nothing Sir," Ishmael answers, "But I have no doubt I shall soon learn."

While research is ongoing, the purpose is to gather as much casualty information as possible and present it in a form consistent with present day statistics. We researched fishing vessel casualties by perusing numerous periodicals in many ports during the past 200 years and compared that data with current data used to assess safety trends.

The 1st Coast Guard District has maintained a fishing vessel casualty database since the inception of the Fishing Vessel Safety Regulations. The database measures the effectiveness of the fishing vessel safety program while providing an avenue to identify casualty trends.

It is generally accepted that fishing vessel safety problems arise from a variety of three main interacting risk groups:

(1) **Vessels: Construction, design, outfitting, navigational and operating equipment (Technology)**
(2) **Crew: Professional competency, training, expertise.**
(3) **External factors: Principally weather and economics.**

It is within these parameters that the historical information will be assessed.

THE PRESENT

In 1991 the first comprehensive safety regulations were enacted that targeted the fishing industry, because it was perceived as the most dangerous occupation in the nation. At the time, 250 vessels and 100 fishermen were cited as lost each year.

It is interesting to note that today's fishermen face the same external challenges as their forefathers. Fish population declines, and taxation and low prices constantly affect the health of the industry. For every event facing the industry today, a similar one occurred in the past.

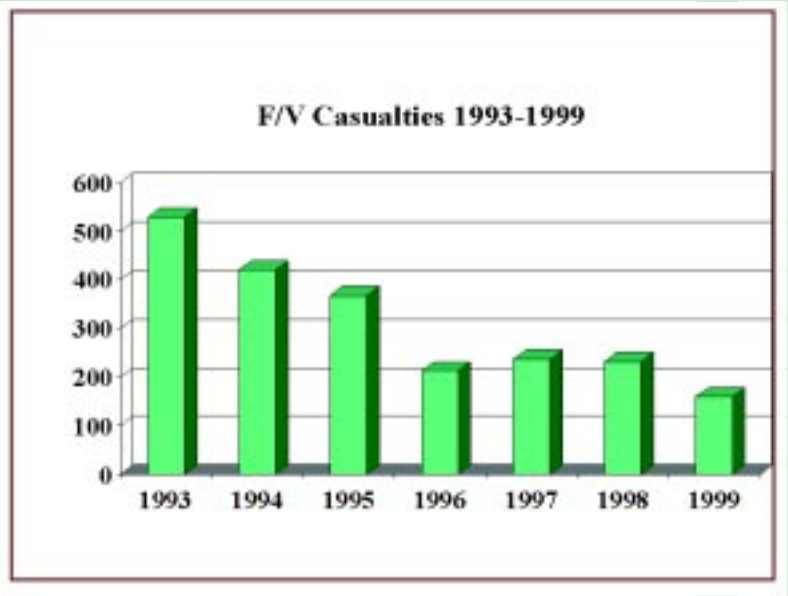
To analyze casualty trends within the fishing industry, it is necessary to normalize the data. There are approximately 18,000 commercial fishing vessels and an estimated 40,000 fishermen in the northeast today.

THE PAST

To normalize historical casualties is difficult. An article in the "*New Bedford Mercury*" in 1833 placed the number of fishermen prior to the American Revolution at 4,000. In 1848, another article put the number of whaling fishermen in New Bedford/Cape Cod area at 18,000 fishermen based on 25 men per vessel in a fleet of 875 vessels. The Gloucester and northern region's fleet was comprised of smaller schooners with 12 men per vessel. References to Gloucester and surrounding cities placed the number of fishermen at 8,000. With other New England ports, there were an estimated 35,000 fishermen in the area during the mid-1800s. While the number of active fishermen is constantly changing, it has not changed much proportionately from other periods in history. These estimates allow the possibility of making rudimentary assessments of casualty trends over a longer period of time. ➤

PAST AND PRESENT

Casualties are always the result of multiple causal factors that involve the vessel, its crew and weather state. It is within this realm of causal factors weighted by the aforementioned risk groups that safety progress and future actions should be evaluated.

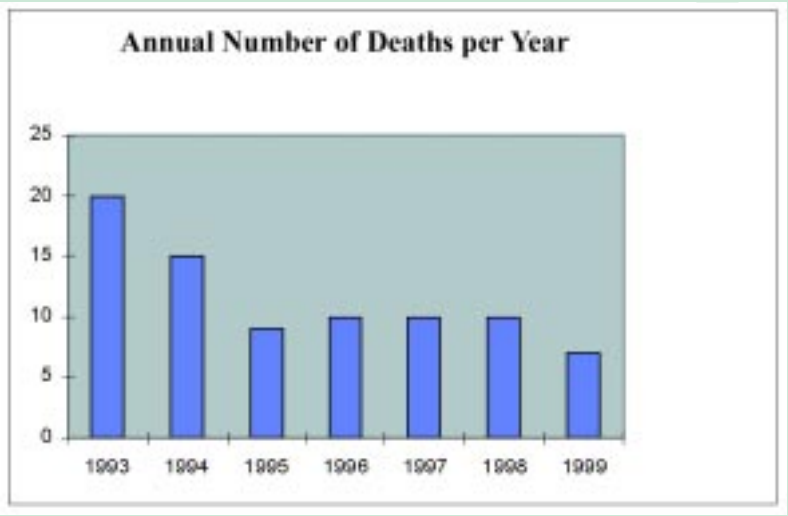


Graphs reflect 1st Coast Guard District only.

Vessel equipment and design throughout the years are two variables that have consistently improved safety. In the 1800s, almost 90 percent of all deaths were attributed to vessels capsizing or sinking. By the late 1900s, the major type of death in the industry was man overboard. Human factors dominate the casualty cause in virtually all recent deaths.

PRESENT CASUALTIES

The most prominent measurement of safety effectiveness is the number of deaths. There has been a downward trend in deaths since 1991, with 1999 seeing the fewest deaths in the history of New England fishing.



Similarly, the number of all casualties involving fishing vessels has seen a corresponding drop. The decline was significant after the inception of the safety regulations, but those numbers also plateau between 1996-99. Opinions for this are offered throughout this paper.

The key to improving safety is to identify trends throughout a period of time. It is important to not just identify how fishermen died, but also, why they died.

Fishermen falling overboard is the single biggest cause of death in the Northeast followed closely by vessel sinkings and capsizings. This represents a historical shift in type of deaths from prior periods.

Of the seven deaths in 1999, human factors played the biggest role in all but one. An analysis of these deaths shows that most of them could have been avoided if personnel were better trained, made better decisions, and devoted more time to maintenance of equipment.

PAST PRACTICES

There were approximately 700 Barks and Brigs in the New England whaling industry and approximately 2,000 schooners on the banks in the mid-1800s. Vessel design capability, poor maintenance, lack of survival equipment, no communication and virtually no rescue resources doomed the vast majority of vessels lost at sea.

Fish were abundant in the first half of the 19th century and could be caught within sight of land. As fishing became very profitable, the number of fishermen increased, as did their methods. Soon, cod and whales began to disappear, which required fishermen to venture further from shore. This increased the risk by exposing the crews to more days at sea, more severe weather and in vessels not properly designed or equipped for the area of operation.

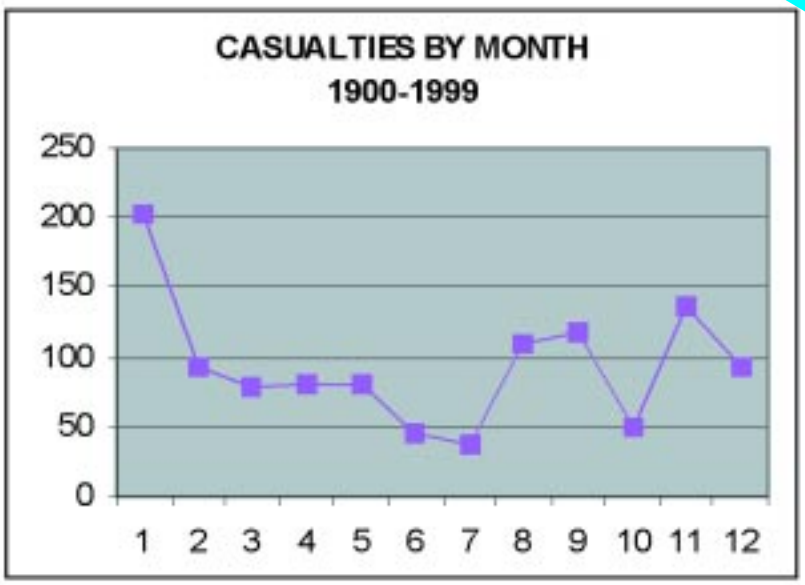
Whaling barks carried three to five whaleboats that were launched to harpoon whales and return them to the mother vessel. Each boat had a crew of three to five men led by the harpooner. Hundreds of fishermen died when struck or pulled over the side by whales. Many more were lost at sea. With the technological advance of the Whale Gun in 1847 there was no reason to deploy whaleboats and the death rate decreased accordingly.

Sailing schooners dotted the coasts of Massachusetts and Maine. These vessels journeyed to the Banks and stayed for weeks and months at a time. However, in winter, the Banks were frequently the scene of treacherous storms. ►

Fishing was done by launching dories over the side. Two to three men would hand-fish for the day sometimes 10 or more miles from their vessel. These small dories and whaleboats accounted for the deaths of hundreds of fishermen.

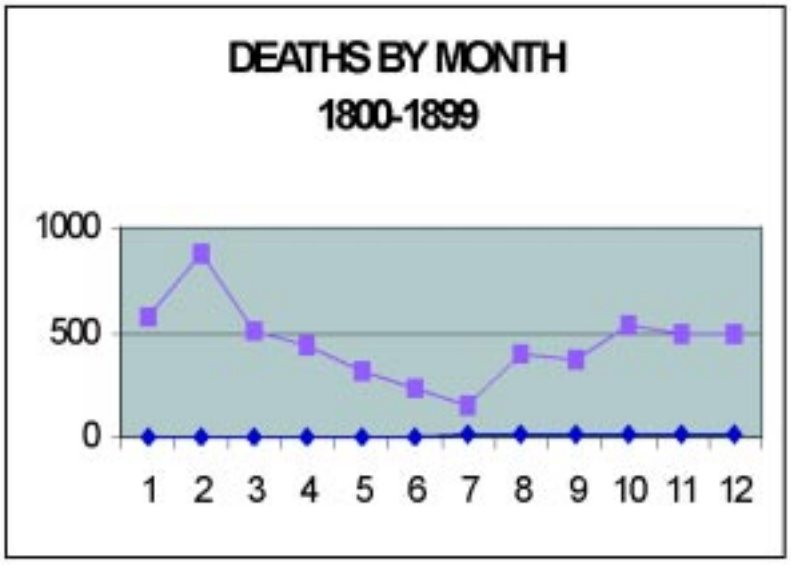
Weather severity can be associated with time of year. These graphs show that winter in the North Atlantic has clearly been a factor in casualties.

Vessel design, technology and equipment posed the biggest risks in the 1800s and early 1900s. As time and engineering concepts progressed, there was a gradual shift from vessel design being the main risk to members of the crew presenting the biggest risk.



THEN AND NOW

After the Fishing Vessel Safety Act of 1988 a steady decline began in number of fatalities exoerienced in the Northeast. From an average of 46 during the 1970s and 1980s, deaths were reduced to 20 in 1993, 15 in 1994 and nine in 1995. Between 1996 and 1998 10 deaths were reported. Last year there was a historical low of seven.



Graphs reflect New England area only.

In the 1800s and early 1900s fishermen relied on both fishing skills and nautical/seamanship skills. As technology progressed, there was more reliance on technology for both fishing and seamanship. This erosion of nautical/seamanship skills is evidenced by the rise in human factor related casualties.

Last year all of the seven casualties could have been prevented if the crew was better drilled and had exercised safety as a total concept.

THE FUTURE

Before we enact more regulations, we must provide an answer to two very basic questions: What realistic level of safety is to be achieved and what is an acceptable casualty rate. It is not palatable to accept any deaths, but fishing is inherently dangerous.

The initiatives most likely to improve safety must address human factors. Any new regulation must involve professional competency that encompasses fishing, nautical and safety skills. Non-regulatory initiatives should promote safety as a total concept, building awareness of lessons-learned both nationally and internationally. Technology has changed but people have remained basically the same. We must find effective ways to modify the behavior of fishermen that are both practical and realistic.

Does Safety Have to Be Regulatory?

by LCDR Ernie Morton, Assistant FVS Coordinator, Seventeenth Coast Guard District

The U.S. Coast Guard has developed a Fishing Vessel Safety Action Plan based on the recommendations of its Fishing Vessel Safety Task Force. The cornerstones of this action plan are to request legislative authority to require Dockside Exams and to change the regulations to require at least one person onboard a fishing vessel to attend a formal training course on safety and conducting drills. The legal and administrative process will require a two- to five- year period before enforceable regulations are in place. In the meantime, there are several ways to improve safety of the fleet in a non-regulatory manner. These include a focused risk assessment and increased interaction with fishermen.

"Risk Assessment. Risk Management. Risk Remediation." These phrases have enjoyed a lot of ink in the popular press lately, but what do they really mean? They mean different things to different people. Risk assessment is the considered, logical evaluation of risk. A risk generally has two components. The first component is the likelihood that an undesirable event will occur; the second are the consequences that will result if that undesirable event does occur. Risk Management is the policy side of the equation, of how the risk is diminished or eliminated. Fishermen often accept risk with a fatalistic attitude, that it is merely part of the life they have chosen and there is nothing they can do about it. "Fishermen have established a pattern of denial and trivialization as part of their occupational subculture. They do this in order to relieve the psychological pressures that occur when they are forced to constantly face the reality of the dangers of their occupation."[1] Several recent studies have found, however, that when given safety training or a systematic assessment of their risks, fishermen can find ways to mitigate these risks. The Coast Guard should build on the fishermen's ingenuity and give fishermen a tool they can use to improve safety. The Coast Guard must develop a systematic approach that fishermen can use to identify the risks they face everyday aboard their vessels and create appropriate strategies to mitigate these risks.

USCG photo courtesy CDR William J. Ubert.

Risk studies

Several studies have found that fishermen who are asked to focus on their own perception of what constitutes risk may be able to find ways to control or eliminate the risk. A study conducted by Victoria Acheson of the Workers' Compensation Board of Canada asked a group of fishermen to attribute the causes of accidents that had occurred on their vessels. Acheson's conclusions provide a basis for an approach to lead the fishermen to become more involved in their own safety:

> "Policy makers have traditionally ignored the human, behavioral and attitudinal factors even though American and Canadian analysis of fishing vessel accidents indicate that human factors directly or indirectly contribute to 70 percent to 90 percent of incidents (National Research Council, 1991, pp. 13-14). Researchers have not usually considered fishermen's accident stories, and have often functioned from an objective and quantifiable view of the world.
>
> Through fishermen's own accident accounts, and the analysis of those stories, this study found that fishermen attribute their accidents to a broad spectrum of causes, a significant portion of which reside outside techno-rational concerns that focus on maintenance of machinery, and safety equipment in general.

The comparison of risks in the suggested activity may help convey the nature and size of a specific risk estimate for fishermen. Such comparisons would be a starting point for them to systematically address risks attached to different decision options. In the future, they may reconsider options available to them during their decision making process and more readily ask themselves the questions, "Am I taking an informed risk? What can I do to control or eliminate that risk?" Without the discussion and exercise these risk comparisons may not be apparent. Fishermen's attributed causes of accidents represent a link to ➤

their perceived safety concerns. Instead of trying to downplay or ignore that fishermen take risks, the proposed approach suggests acknowledging the attributed causes of accidents. Using that information, fishermen can then gain insight into their own risk-taking and decide how to minimize those risks."[2]

Researchers at the University of Rhode Island found that fishermen tend to "trivialize or totally deny the dangers associated with their occupation"[3] as a technique for coping with the danger they face everyday. "The psychological strategy of denial and trivialization can result in fishermen who are poorly informed about the nature of the real dangers of their work."[4] However, these researchers believe that sharing information about casualties helps to overcome this denial strategy. The researchers found that fishermen who have attended a two-day fishing vessel safety training course became more aware of and more cautious regarding items that are not immediately dangerous but that can create serious problems if not dealt with quickly and properly.. Examples of these items include several inches of ice in the rigging, fire in the galley, or a fall that results in a broken arm or leg.

The National Institute for Working Life in Sweden published another study in the summer of 2000. This study was conducted to determine the long-term effects of a participatory method for implementing safety measures. Researchers found that 96 percent of the safety measures implemented following a one-on-one interaction between the fishermen and the project safety engineers were still in place after two and one-half years.

Current Efforts

The Coast Guard currently has several programs that address fishing vessel safety and management of risks. The most widespread and long-standing is the Voluntary Dockside Examination program. This program provides fishermen an opportunity to have a Coast Guard Fishing Vessel Safety Examiner conduct a thorough examination of their vessel and ensure it is in compliance with all applicable federal regulations.

Recently, the Coast Guard in Alaska, Washington and Oregon initiated a pier side enforcement program. Vessels are boarded at the dock prior to major fishery openings, such as the Bering Sea king crab or opilio (snow) crab season, to verify compliance with vessel stability requirements, and primary life-saving equipment requirements, and to discuss ➤

Excerpted From:

OPERATION SAFE RETURN: A NONTRADITIONAL APPROACH TO IMPROVING COMMERCIAL FISHING VESSEL SAFETY

by CDR William J. Uberti, deputy chief, Pacific Area Marine Safety Division

Statistics for Coast Guard Pacific Area Command (PACAREA) between 1997 and 1999 (before "Operation Safe Return" went into effect) showed an average of 32 deaths – the highest number of commercial fishing casualties in the United States at 95 percent. Analysis of these casualties revealed that more than 80 percent were due to human error (of which fatigue played a major role) and lack of vessel maintenance (due to financial pressures). If the status quo remained unchanged, these casualties could increase due to the present decline in the commercial fishing industry caused by depletion of fish stocks and subsequent increased competition. The resulting shorter fishery windows have already forced Pacific Fishermen to accept higher levels of risk by fishing during extremely bad weather and sea conditions in order to make a living – risks that many times bring fatal results.

Focused Approach – Pacific Crab Industry

The sheer size of the Pacific Area along with its numerous fisheries warranted a focused approach to provide effective use of Coast Guard resources. Crab boats generally range from 30-50 feet in length and carry crews of two to four persons and up to six to 12 people in the Alaska area. Often times the fishermen overloaded their decks with crab pots or catch causing flooding, capsizing, and subsequent sinkings, especially during rough weather conditions. PACAREA's goal was to significantly reduce the number of fatalities through dockside education and safety checks – not burden fishermen with multiple at-sea boardings. Instead of increased at-sea boardings (which many times could not take place due to heavy sea and wind conditions), PACAREA utilized a more effective approach consisting of public education, outreach, and cooperation.

Other Operation Safe Return Programs

Although Operation Safe Return concentrated on the crab industry, it also encompassed many other programs throughout PACAREA. These included: Operation Alaskan Sentinel (Halibut & Sablefish), Operation Southeast Safeguard (Dive Fisheries), Operation Arctic Safeguard (Red King), and Operation Florentine Coast (Hawaiian Fisheries). These operations proved successful in increasing Coast Guard and fishing industry cooperation.

On the Right Track

Operation Safe Return's initial results appear promising, however, commercial fishing remains a highly competitive, ruggedly individual, high-risk industry. PACAREA's change in the way it conducts business with the fishermen is working and has netted a significantly lower fatality rate for 2000. By treating the fishermen as customers and tailoring Coast Guard outreach programs to address the fishermen's concerns, PACAREA has managed to lower the risk in this inherently dangerous profession and return many more fisherman home safely to their loved ones.

man-overboard contingencies with vessel masters and crews. Any vessels not in compliance with stability and lifesaving equipment requirements are required to correct their deficiencies prior to getting underway. Nearly one-third of the vessels boarded had deficiencies in their primary lifesaving equipment that would have prevented the equipment from working properly in case of an emergency. Captain of the Port orders are placed on vessels with serious, multiple deficiencies. Three vessels of the 160 boarded in a recent operation were restricted from operating under Captain of the Port orders but all were able to correct their problems before the season began and were allowed to get underway. Although this type of boarding has the potential to be more confrontational than a Voluntary Dockside Exam, it has been generally well received in its first few events.

The Coast Guard's Atlantic and Pacific Area commanders developed operation Safe Catch and Operation Safe Return in late 1999. These operations were designed to identify high-risk vessels and to specifically target these vessels for increased contact or boarding scrutiny. In conjunction with Pacific Area's Operation Safe Return, the Coast Guard in Alaska (17th District) developed the "Ready for Sea" program. The three elements of this new safety program are listed below:

"Top 10" Safety Check Off List: This checklist is comprised of factors that have historically prevented accidents and ensured survival when accidents have occurred. Several of these safety factors are non-regulatory, but are "the standard of care" used by the most safety conscious operators. Reviews of accidents during the last 10 years have shown these safety factors make the difference between vessels and crews that are "Ready for Sea" and survive incidents and those that are not!

"Lessons Learned": By sharing "Lessons Learned" from the Coast Guard investigations of fishing accidents through D17 Safety Alerts, this 17th District initiative is designed to be a quick look at the circumstances that may have contributed to an accident or reduced the severity of an accident.

Increased Interaction Between the Coast Guard and the Fishing Industry: This element includes increased communications and contact with fishermen through expanded safety partnerships, communication of "Safety Alerts" via newsletters, magazine articles and the World Wide web, conducting voluntary dockside exams snd underway boardings. The objective of this expanded contact is to increase attention to safety issues and compliance with safety regulations and receive feedback from the industry. As the Swedish researchers found in their two and one-half year study, "the fishermen who accepted the offer [to participate in the study] had a more profound interest in safety matters than others did.

Mitigation

So how can we reduce the risk to fihermen? The first step is obviously to define and identify high-risk vessels, fisheries and behaviors. Then we must focus our efforts towards that segment of the industry and discuss with fishermen their perception of risk, and educate them about the additional risk. As part of this interaction we should help fishermen learn how to identify and assess risk for themselves. The Coast Guard has put a significant effort into developing operational risk assessment strategies for Coast Guard people to use in the course of conducting Coast Guard missions. This strategy should be adapted and exported to the fishing industry to assist their efforts in promoting a safer industry. We must then expand the scope of our dockside exams and boardings to include those non-regulated items that may pose significant risk. Those non-regulated items include the stability of smaller vessels, crew standards and training, and wearing personal flotation devices while on deck. We must strive to "add value" to every interaction with the fishermen, where we have somehow raised the level of safety on board their vessel.

The Rhode Island researchers argue, "It is very important to understand the subjective patterns of fishermen's perceptions of danger so that policy makers, safety trainers, and fishermen themselves may deal with this problem realistically and thus increase the level of safety within the industry."[5] Many of the tools needed to understand the subjective patterns of fishermen's perceptions of danger are taught in the Human Factors Engineering course that is part of the Coast Guard's Senior Marine Inspector course at the Coast Guard Marine Safety School in Yorktown, Virginia.

Thirty percent of the fishermen who participated in the Swedish study said they would need an accident to happen before they would implement additional safety measures, and only 2 percent stated that legislation would persuade them to implement additional safety measures. If nearly one-third of the fishermen are waiting for an accident to happen, and yet such a small percentage of the study's concerned fishermen think that regulations would make much difference in safety, then there is an extremely compelling argument for developing and sharing lessons learned in an open, interactive forum. If we can show fishermen the evidence of recent casualties and link those casualties to factors that may also be present on the fishermen's own boat we may be able to break through the wall of denial that manifests itself as the "accidents-only-happen-to-the-other-guy" attitude.

Initiatives such as pier-side enforcement spot checks, teaching fishermen to conduct a formal risk assessment of their vessels, and developing a forum for sharing lessons learned, in which the industry will participate fully, will require considerably more effort than a conventional boarding or dockside exam. It will conceivably result in a marked increase in safer operations of fishing vessels. This extra effort will be well worthwhile if it saves fishermen's lives.

The author wishes to thank Sue Jorgensen, Sue Hargis, Neal Amaral for their invaluable recommendations in preparing this article.

1 Acheson, Victoria, (1999) "Fishers' Attributed Causes of Accidents and Implications for Prevention Education." Unpublished paper presented at the International Fishing Industry Safety and Health Conference, Woods Hole, MA Oct 2000.

2 Ibid.

3 Poggie, John J., Pollnac, Richard R. (1995) "Cultural Adaptation to Danger and the Safety of Commercial Oceanic Fishing," Human Organization, Vol. 54 Issue 2.

4 Ibid.

5 Poggie, John J., Pollnac, Richard R. (1997) "Safety Training and Oceanic Fishing," Marine Fisheries Review, Vol. 59 Issue 2.

Fishing Vessel Stability Principles Explained with a Model

by CAPT Barb Howe, ON1 (Canadian), M. Ed., Quinte Marine Services, Ltd.

Commercial fishing is a dangerous occupation. Frequently the cause of a fishing vessel incident at sea is loss of transverse stability. The Transportation Safety Board of Canada (TSB) has reported that the effect of overloading or design modification on fishing vessel stability is often ignored by vessel owners and operators (*"Reflexions"* July 1995). In *"Dying to Fish, Living to Fish: Fishing Vessel Casualty Task Force Report,"* it is reported that "common conditions in many recent casualties" include a "lack of awareness of or ignoring stability issues" (Spitzer, J.D., USCG March 1999). Stability related incidents continue to occur, while regulatory bodies and those who provide safety training for fishermen continue to debate how training and education programs should be shaped.

In mid-1998 I learned that the U.S. Coast Guard was having 12 models of a 1/16 scale free-floating West Coast seine boat constructed to be used for teaching principles of stability. The model was part of the USCG's Prevention Through People program that also included a damage control stimulator.

I submitted a grant proposal with the Workers' Compensation Board of British Columbia, Canada to have a model built, similar to those the USCG was using. Operationally, the proposal was to take the model to B.C. fishing communities and demonstrate principles of stability in informal settings.

The Model

The model came with full stability particulars in a stability data book, compiled from information by an incline test done on the model. Vertical weights were provided that could be raised or lowered to change the model's center of gravity, and a weight that could be suspended from the boom. The model, however, had considerable freeboard and was inherently very stable. Raising and lowering the vertical weights did not represent the removal of weight as with consumables. If the weights were removed from the vessel it would capsize. As equipped, the vertical weights, elaborate pumping system and removable transverse bulkheads were not enough to show the whole picture of what happens to a vessel's stability during the course of a fishing trip.

I wanted to be able to demonstrate the cumulative nature of factors that can compromise the transverse stability of a fishing vessel in the course of working operations:

- Fishing vessel righting energy varies according to condition of load
- The free surface effect of water on deck and liquids in holds and tanks result in the virtual rise of G
- Flooding in the lazarette, engine room, or forepeak
- Angle of loll, as opposed to list
- Lifting weights over the stern or over the side
- Carrying traps or pots on deck
- Structural modifications that reduce initial stability

My first experimental approach was to isolate different principles of stability and demonstrate them as separate scenarios. It quickly became evident that stability principles could be better presented if I simply started with the model in lightship condition, loaded gear and ice and went fishing with it.

I soon found that by adding a freezer and gear lockers to the top of the deckhouse the center of gravity was raised. This demonstrated the progressive rise in G by the general accumulation of weight on the deckhouse. Bags of marbles became fish and ice. There was a seine net that could be moved from the deck into the forward hold, and a 10-ton bag of fish that could be lifted with the boom. I built crab pots that could be stacked in units that were four deep on the entire deck. The crabber could be converted to a logliner by replacing the crab pots with a bait shack. Tins of tomato paste represented 45-gallon drums of fuel on the deck of a troller, modified to go for tuna at the dateline.

With these fishing appurtenances, I put to sea with a dialogue of opportunity and good fishing, mixed with poor operating judgment. None of the fishing trips were exactly the same. By blurring the principles of stability within the context of a fishing trip, the demonstration better depicted the reality.

Because the model was inherently stable, some of the items used were not weighted to scale. This bending of scientific purity was necessary in order to replicate the progressive loss of transverse stability to the point of capsize.

The Demonstration

This was the demonstration I took on the road in February 1999 to various venues. I anticipated that participants would want to go fishing with the model and my role would be as facilitator. Unfortunately, this was not the case. Although participants asked questions, as learners they generally were passive rather than active.

I could demonstrate the effect of the GZ righting lever by changing the displacement of the model. In one condition it would be extremely tender, and in another very stiff. I sketched the GZ righting lever and showed how its length changed depending on the vessel's center of gravity. I also explained that the center of buoyancy moves to the geometrical center of the underwater volume, and is an integral factor in determining the length of GZ. I emphasized that, whereas a skipper has no control over the underwater form of his vessel, he is in control of how weights are loaded, distributed and discharged.

A particularly dramatic demonstration of the effect of free surface could be given. With the model in a condition of a load that I knew made it vulnerable to free surface, I plugged the freeing ports. Water accumulated on deck, ▶

equivalent to a full coffee cup, and resulted in the vessel's capsize. This demonstration presented a teachable moment with many participants. Their comments reflected an honest recognition they did not fully appreciate how dangerous free surface could be.

Most fishermen were surprised to find that the "worst operating condition" is often when heading back to port with a full load. I explained with sketches how low freeboard and deck edge immersion could compromise a vessel's ability to return upright. Whether or not to add ballast was a common question. I could only point out that weight added results in reduced freeboard and needs to be factored into a particular vessel's stability calculations by a naval architect.

Observations

The model, with my narrative and the theoretical explanation using sketches, was an attempt to reach a larger audience than the classrooms I have taught in; I wanted to popularize knowledge of fishing vessel stability principles. The Canadian requirements for formal training are related to vessel size and area of operation. There are many fishermen operating smaller vessels who are not required to have any formal training in stability.

It is a concern of the TSB that many of the fishing vessel stability incidents involve the smaller fleet. Although I was unable to collect exact data on the types of vessels that participants worked on, my sense was that the majority represented the smaller fleet.

My conceptual intent with the model was to pull together my experiences in the classroom with a practical demonstration. I believe that, in part, this vision was not realized because of the informal nature of many of the demonstrations, and participants did not have the prior bond and safe sense the classroom had provided.

What appears to be important is a middle ground where discussions about fishing vessel stability connect the theoretical and the experiential. The Coast Guard reported that at seminars conducted in Dutch Harbor between Jan. 10-14, 1998, the stability training model provided highly effective in drawing fishermen into discussion of their experiences relating to stability. This may, in part, have been because the seminar format was a structured presentation given in advance of a targeted fishery opening. There may also have been other factors in the learning environment that encouraged this open discussion.

The author with the model she used to demonstrate stability principles, *ABOVE* and *BELOW*. Photo courtesy CAPT Barbara Howe.

Conclusion

It is likely that no single approach can successfully educate fishermen about vessel stability. In the report *"Damage Control and Stability Training Effort,"* it is suggested that the model, in combination with a classroom presentation on basic stability concepts, is likely to be the most effective. My experience would be to confirm this.

The nature of the grant from the WCB was such that it was not feasible to tandem demonstrations with other education/training programs. Had this been possible, the classroom comfort zone mentioned previously might have been better realized. The model did, however, demonstrate principles of stability to fishermen who otherwise may not have other learning opportunities. Their initiative to attend a demonstration is an indication that there is concern and interest in the fleet about fishing vessel stability.

Nonetheless, it is reported that "in spite of vigorous, well-organized, and widely promoted activities by course organizers, fishermen's reluctance to attend safety courses is a serious cause of concern" (FAO Fisheries Circular No. 966 *"Safety at Sea as an Integral Part of Fisheries Management,"* March 6, 2001). The belief held by some fishermen that "we've always done it this way" will continue to prevail. These two factors, along with how stability education can be most effectively presented, are only a few of the considerable challenges faced by marine training efforts and programs for fishermen.

My experiment, "Fishing Vessel Stability - Proving the Principles," used a model to explain vessel stability. Although in broad terms, the overall effectiveness of this training effort was difficult to assess, it struck a chord with at least one fisherman. He said that the next time he had a 'green' deck hand and the weather "came up", he was going to ask the deck hand to go below and "get the GZ righting lever."

DC TRAINER LOCATIONS

Marine Safety Field Office
918 South Rodney French Blvd.
New Bedford, MA 02744
Attn: Mr. Kevin Coyle
Office: (508) 999-6812

Marine Safety Office Miami
Claude Pepper Federal Building
51 S.W. 1st Avenue, 5th Floor
Miami, FL 33130-1608

Eleventh Coast Guard District Building 50-6
Coast Guard Island
Alameda, CA 94501-5100
Attn: Mr. Dennis Robison
Office: (510) 437-2947

Marine Safety Office Morgan City
800 David Drive, Room 232
Morgan City, LA 70380-1304

Marine Safety Office Portland
P.O. Box 108
Portland, ME 04112-0108

Marine Safety Office Hampton Roads
Norfolk Federal Building 200 Granby
Street, Suite 700 Norfolk, VA 23510
Attn: CPO Jim Berryman
Office: (757) 441-3285

Ninth Coast Guard District
1240 East 9th Street
Cleveland, OH 44199-2060
Attn: CDR Ron Branch
Office: (216) 902-6052

MSO Los Angeles/Long Beach
1001 South Seaside Avenue
San Pedro, CA 90731
Attn: Mr. Fran McClain
Office: (310) 732-2062

Thirteenth Coast Guard District
Jackson Federal Building, Room 3506
915 Second Avenue
Seattle, WA 98174-1067
Attn: LCDR Jane Wong
Office: (808) 541-2117

Marine Safety Office Juneau
2760 Sherwood Lane, Suite 2A
Juneau, AK 99801-8545
Attn: Mr. Larry Snyder
Office: (907) 463-2448

Marine Safety Detachment
Unalaska
Dutch Harbor, AK

Fourteenth Coast Guard District
Prince Kalanianaole Federal Bldg.
300 Ala Moana Blvd., 9th Floor
Honolulu, HI 96850-4982
Attn: ENS James Stellflug

Marine Safety Detachment Kodiak
P.O. Box 190055
Kodiak, AK 99619-0055

STABILITY TRAINER LOCATIONS

MSO Sault Ste. Marie
c/o Coast Guard Group
Sault Ste. Marie, MI 49783-9501

First Coast Guard District
409 Atlantic Avenue
Boston, MA 02210-3350
Attn: Mr. Ted Harrington
Office: (617) 223-8440

Eleventh Coast Guard District
Building 50-6
Coast Guard Island
Alameda, CA 94501-5100
Attn: Mr. Dennis Robison
Office: (510) 437-2947

Marine Safety Office Morgan City
800 David Drive, Room 232
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Marine Safety Office Juneau
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Jackson Federal Building, Room 3506
915 Second Avenue
Seattle, WA 98174-1067
Attn: LCDR Jane Wong
Office: (206) 220-7217

Call your local District or Marine Safety Office today to schedule a demonstration!

A Review of an "At the Dock" Stability & Pot Loading Survey

Dutch Harbor, Alaska (October 10-15, 1999)

by LT Chris Woodley, Thirteenth Coast Guard District, CFVS Coordinator
Charlie Medlicott, MSO Anchorage, AK, CFVS Coordinator

USCG photo.

Fishery Background

The Bering Sea Crab fisheries are among the most prominent in the United States and the most dangerous, according to the National Institute for Occupational Safety and Health (NIOSH).[1] Vessels engaged in these fisheries are industrial and highly specialized for the service in which they participate. The average vessel gross tonnage is less than 200GT, length is between 90 feet-120 feet, and has a crew of five to six people. These vessels utilize pot gear to harvest the crab, with pot dimensions measuring approximately 7 feet x 7 feet x 3 feet and each pot weighing approximately 700-750 pounds. Alaska Department of Fish & Game imposed pot limits for the October 1999 Bristol Bay red king crab fishery as a way to manage fishery efforts. Vessels greater than 125 feet are allowed to fish 200 pots, and vessels less than 125 feet are allowed to fish 160 pots. Many vessels cannot safely carry the total number of pots that they are allowed to fish. As a result, storage of unbaited gear near the fishing grounds, called wet storage, is permitted.

Despite efforts by the North Pacific Fisheries Management Council to limit effort in all the Bering Sea crab fisheries, the fleet is overcapitalized. The 1999 Bristol Bay red king crab fleet is composed of 260 vessels.[2] As a result of overcapitalization and the tremendous catching power that is present among those registered vessels, the fishing seasons are typically very short, averaging about five to six days throughout the last decade. This relationship between catching power, limited resources, and short seasons has resulted in a race to fish. The total focus in such a fishery, if the vessels are to be economically competitive, is to catch as much crab as possible, and as quickly as possible, before the season is closed. In 1999, the fleet was described by crab industry leaders as being in a state of crisis. Recently detected declines in Bering Sea crab stocks, and the resulting closures and potential closures of several major crab fisheries, has resulted in a very poor outlook for the fleet. The significant drop in supply has also resulted in a 33 percent increase in price of crab. Based on the proposed Guideline Harvest Level (GHL) of 10.1 million pounds, the 1999 fishery is expected to be the second most valuable Bristol Bay red king crab fishery in nearly two decades.

The poor outlook and high prices resulted in the October 1999 Bristol Bay red king crab and the January 2000 Bering Sea crab opilio fisheries as being "make it or break it" seasons for many owners. In attempts to avoid delays, wet storage may not be utilized because of the time needed to proceed to the wet storage site and retrieve gear. In terms of safety, these fishery and economic pressures will create significant incentives to overload vessels with crab pots, and to fish without rest.

Casualty Analysis

Historical casualty analysis of the Bering Sea fishing fleet indicates that fishing on crab vessels is an extremely hazardous occupation. From 1990-1999, 66 people died in these crab fisheries as a result of capsizing, sinking, man overboard, and industrial ▶

accidents, such as being crushed by crab pots. To put this number in perspective, the Bering Sea crab fishery has accounted for one-third of the 200 total commercial fishing industry fatalities in Alaska from 1990-1999. Crab vessels are susceptible to certain kinds of casualty events. When fully loaded with pot gear, these vessels are susceptible to capsizing, especially during icy conditions. From 1990-1999, 41 people on 11 vessels died on these vessels as the result of capsizing.

Additional fatality analysis within the Bering Sea crab fleet indicates that the number of fatalities per 100,000 workers has risen. Fatality rates have increased from an average of 127 fatalities per 100,000 from 1990-1994, to 272 fatalities per 100,000 from 1995-1999.[3] While there is no definitive cause for this rise, the shorter seasons, increased competition, race to fish, and overall economic health of the crab industry are all probably contributing factors.

Crab boats rafted together. USCG photo.

Action Plan Development

Recognizing these factors and motivations as they became apparent, LT Chris Woodley, from the 13th Coast Guard District Office, Mr. Charlie Medlicott from MSO Anchorage, and LCDR Steve McCleary from MSD Unalaska developed a plan that would simultaneously:

- Provide for increased interaction with the crab fishing industry;
- Provide a mechanism to review stability-related issues with vessel masters;
- Allow for the collection of stability and vessel safety data; and
- Deter overloading in the Bristol Bay red king crab fishery.

The team solicited expert input and guidance from members of the commercial fishing industry and fishery managers. The input from these individuals was invaluable in implementing a viable and workable approach that would address key areas of concern without imposing an unnecessary burden on the crab fleet.

Action Plan

A unique opportunity was necessary for the Coast Guard to achieve its outlined goals. The ADF&G tank inspection program provided the ideal opportunity. One week prior to the crab season openings, ADF&G personnel would board all crab boats registered for the fishery to conduct tank inspections, which are conducted to ensure that only legal gear is onboard, examine the holding tanks for the presence of crab, and sign up vessels for in-season reporting. Because tank inspections provide for 100 percent coverage of the fleet, the action plan developed was for the Coast Guard to accompany ADF&G during these inspections. While ADF&G personnel fulfilled their resource management obligations, the Coast Guard would review vessel loading and stability issues with the master and check for overloading.[4] Operating in this manner, the ADF&G/USCG team would be on each vessel for a total of 10-15 minutes.

The goals and overall tone of the boardings would be primarily educational and deterrent-based. Boardings would provide an opportunity for Coast Guard personnel to discuss safety/stability issues with the master of the vessel, and give the master the opportunity to review the stability information with the Coast Guard. While on board, Coast Guard personnel would determine if a stability letter/book was available, determine the level of stability training possessed by the master, and determine if the vessel was overloaded as compared to the limitations defined in the vessel's stability letter/book. While the overall focus was educational, vessels found to be in an overloaded condition would be dealt with as a law enforcement issue.

Nature of the Work

Boarding crab boats at the dock presents a dangerous, but manageable risk to Coast Guard personnel. Due to the significant lack of pier availability, crab vessels are moored alongside each other, up to seven vessels deep. To board these vessels requires climbing from vessel to vessel and climbing over stacked crab pots. Gangways, ladders, safety nets, etc. are rarely, if ever, present. Additionally, this climbing activity occurs 20-30 feet above the water or deck of the vessel. A fall could easily result in severe injury, and an unnoticed fall could result in death.[5] Other risks to Coast Guard personnel include being struck by moving fishing gear, as well as being run over by heavy equipment operators who transfer gear from pot storage to the fishing vessels.

To mitigate these risks, stability/tank checks occurred during daylight hours only, and boarding teams consisted of two members. When pot movement was occurring, Coast Guard boarding officers were instructed to wait until the transfer was complete before moving through the area. When climbing pots, examiners were instructed to only climb on pots that had been secured with chain, and to never climb up the face of a pot.

Results

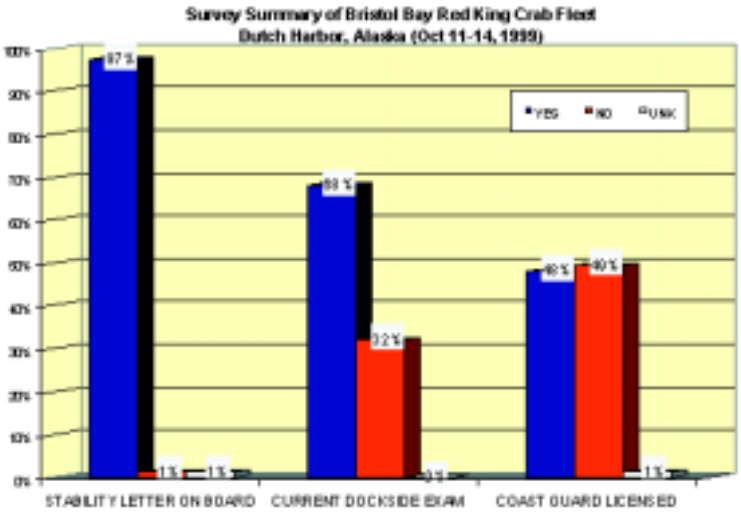
Between October 11-13 of 1999, three Coast Guard/ADF&G teams boarded 75 of 150 crab vessels that conducted their tank inspections in Dutch Harbor.[6] Of the 75 vessels boarded, the fishing vessels *Dr. K* and *Kristen Gail* were found to be overloaded. This was determined by comparing the vessel's pot load with its stability report. Two Captain of the Port (COTP) orders restricting the movement of the vessels were issued by MSD Unalaska. The letters directed the vessels to remain moored to the dock and provided them with two options: either load the vessel within the limitations of the vessel's stability book/letter, or provide calculations from the stability report's author stating that the vessel ▶

could safely operate as currently loaded. Different options were exercised by each vessel.

Under its existing stability letter/book, the *Dr. K* was allowed to carry 124 pots but had 144 pots on board. The master of the *Dr. K* resolved the issue by removing the 20 excess pots. In the other case, Coast Guard personnel detected that the *Kristen Gail* was carrying 151 pots in five tiers. However, the vessel's stability information only allowed 151 pots in four tiers. The Coast Guard consulted with the naval architect firm who issued the vessel's stability letter/book. Both the Coast Guard and the naval architect originally determined that the vessel was overloaded due to the fact that the pots were stacked higher than what was allowed in the original stability book. Within the next 24 hours, however, the naval architect issued new stability calculations allowing five tiers. Upon written notification from the naval architect, the MSD Unalaska rescinded the COTP order.

While the Coast Guard only ordered one vessel to remove excess pots, the presence and subsequent control actions of the Coast Guard seemed to deter others from overloading. The conditions on both the *Kristen Gail* and the *Dr. K* were detected on the first day and word spread quickly throughout the fleet of the actions taken by the Coast Guard. Upon Coast Guard arrival on board other vessels, many masters reported that they had heard rumors of what had happened. One master stated that his insurance pool had contacted him, warning him of the Coast Guard activities. Several other masters also stated they had removed excess gear prior to the Coast Guard's arrival on board. These vessels did not receive COTP orders.

Based on this feedback, it is clear that the Coast Guard presence on the docks had an impact. The response from the vessel operators to this array of activity was overwhelmingly positive. Many fishermen stated that the initiative was "the best thing the Coast Guard had done in a long time for the crab fleet." There was also a high level of support to identify those vessels that were overloaded. In some instances, vessels suspected of overloading were pointed out to Coast Guard personnel by fellow crab fishermen.



Data Review

While on board the vessels, Coast Guard personnel conducted brief surveys among themselves regarding participation with the dockside exam program, stability training, and how safety within the fleet could be improved. This time restriction was necessary to keep pace with ADF&G personnel. Results for the 75 vessels boarded are as follows: 97 percent of the vessels had stability letters/books on board and 91 percent of the reports were immediately available. It appears that while the vast majority of vessels had stability information on board, was readily available, and the masters knew how to use the information, a few did not fully understand basic stability concepts, such as the consequences of reducing freeboard. The remaining majority appeared to fully understand stability concepts and the recommended limits of their stability letter/book. Sixty-eight percent of the vessels had current fishing vessel safety dockside exam decals.[7]

Additionally, 48 percent of the masters possessed a Coast Guard license. For the 55 vessels that were less than 200 GT, 42 percent of those masters had Coast Guard licenses.

Stability Training

The survey questionnaire asked whether the master of the vessel had ever received any formal stability training (classroom, professional reading, computer interactive, correspondence courses, or none); 53 percent of the masters surveyed stated that they had received some classroom stability training; 20 percent claimed to have training from other or multiple sources. Another 24 percent claimed to have never received any formal stability training. Much of the classroom stability training was necessary to receive a Coast Guard license. The vast majority of masters who were license holders stated that the stability training necessary to pass a Coast Guard licensing exam was minimal and the tests had very little practical application. ➤

Summary

Based on the four primary goals established during the planning of this operation, the at-dock loading/stability check was very successful. Coast Guard personnel:

- Boarded 50 percent of the crab vessels in Dutch Harbor during a three-day period;
- Discussed stability, safety, and fishery related issues with more than 70 vessel masters;
- Had more than 70 vessel masters demonstrate knowledge of their stability reports;
- Gathered a large volume of important safety data on the Bering Sea crab fleet;
- Demonstrated that overloading occurs in this fishery and can be detected; and demonstrated that overloading can be corrected with minimum disruption to the vessel.

The commercial fishing industry gives wide support for this kind of action that focuses on the enforcement of existing laws and standards. This activity received significant praise from vessel masters, naval architects, fishing vessel safety experts, crab/fishing industry leaders, and resource managers. While current activities within the fishing vessel safety program such as dockside exams, stability and damage control training, and promotional gifts have their own value, they will not prevent the overloading of vessels in the Bering Sea crab fisheries.

The capsizing of Bering Sea crab vessels has accounted for 20 percent of the total commercial fishing fatalities in Alaska during a 10-year period. The cause of overloading is arguably not lack of stability knowledge regarding vessel limitations (although this can be improved upon), but is rather vessel masters bending to the economic forces and the management regime that defines the fishery. Continued active detection efforts are necessary to prevent overloading. The boarding of loaded crab vessels at the dock is precisely the time when overloading and stability problems can be detected, and where corrective action can be taken in a way that minimizes disruption to vessel operators. The tragic history of Bering Sea crab fleet, with its multiple capsizings resulting in loss of life, combined with the intense competition for crab during this time of reduced harvests, necessitates a credible Coast Guard presence in all ports where tank checks are being conducted. An expanded presence will continue to promote a very positive Coast Guard/crab industry interaction, will emphasize the importance of stability issues, and will ultimately deter overloading of vessels, thus resulting in a safer fishery.

Climbing pots at Westward Seafoods. USCG photo.

1 NIOSH(1997), Commercial Fishing Fatalities in Alaska Risk Factors and Prevention Strategies. Current Intelligence Bulletin 58, pp.2.

2 Eight of these vessels are catcher – processors, meaning that they process their catch at sea, instead of making deliveries to shore.

3 Woodley, C.(2000) "Developing Regional Strategies in Fishing Vessel Safety", Master's Thesis, University of Washington.

4 Stability reports are required by the Coast Guard only if the vessel is greater than 79' and had its keel laid /or had undergone a major conversion or substantial alteration after September 15, 1991. Stability letters on most Bering Sea Crab vessels are not required by the Coast Guard, but instead by the vessel's insurer.

5 Two days before the start of the fishery, a crewmember of the F/V Sultan was severely injured when he fell while jumping between two boats. Head injuries and possible spinal injuries necessitated a MEDEVAC from Dutch Harbor to Anchorage.

6 ADF & G "pre – tanked" 150 vessels in Dutch Harbor, with 2, 44, and 63 pre – tank inspections occurring in Saint Paul, Akutan, and King Cove respectively.

7 It should be noted that based upon the Coast Guard's Commercial Fishing Vessel Casualty Task Force Report, the figure of 69 percent is more than 10 times higher than the national average.

Improving Fishing Vessel Safety Through C&V Surveys

by Timothy R. McHugh, Looney & Grossman, LLP, Boston, Massachusetts
Richard C. Hiscock, President, ERE Associates Ltd.

Marine surveys are done for buyers, sellers, financial institutions, and insurance underwriters. The Condition & Value (C&V), or Insurance survey, which is routinely carried out on commercial fishing vessels for a variety of interests, is the subject of this article.

The primary goal of this discussion is to improve the safety of fishermen through both preventative and remedial actions. That approach is necessarily quite comprehensive, starting with high-level design, construction and maintenance of fishing vessels, through ensuring that fishing crews are able to manage any situation that confronts them by using their knowledge and equipment. Routine C&V surveys are variously described as a "visual" examination of the vessel "to determine whether the vessel is an acceptable risk," and to "assist insurance underwriters in making underwriting decisions."

> The C&V has two purposes: identifying the vessel, its equipment, condition and general value; and identifying defects, damages or hazardous conditions that pose a potential threat to the safety of the vessel and its crew.

C&Vs are not intended to certify that the vessel is built, or conforms to, any standard, nor is there any requirement that the machinery or equipment be tested for proper operation. One U.S. Coast Guard Board of Investigations stated, "the surveys [conducted on the subject vessel] were mostly inventories for insurance purposes."[1] As the result of fishing industry resistance to regulation became more comprehensive than that contained in the Commercial Fishing Vessel Safety Act of 1988[2] (CFIVSA), other measures are required to improve safety. Because fishing vessels are surveyed routinely for purchase, insuring and financing purposes, a mechanism exists that could result in better safety for fishermen, but it will take a proactive approach to succeed.

Introduction

"*The Perfect Storm*", in both book and movie form, has rendered readers and viewers alike in awe of the ocean's power and aghast at its dangers. But, for most, that effect is vicarious.

For those involved in the marine community, the dangers are real. First and foremost, the list of tragedies continues to grow, from A-boats, to the *Andrea Gail*, the *Cape Fear*, the *Two Friends*, and, most recently, the *Arctic Rose*. Second, we know the fishermen who set out to sea to earn their living. Third, we know that fishing vessels are lost in sea conditions far less extreme than those seen by the crew of the *Andrea Gail*. Fourth, we know that the risks of commercial fishing are manageable, and casualties are preventable, yet they continue at what should be unacceptably high numbers.

This paper focuses on a document that is a key element of the business of commercial fishing, the C&V. Insurers and lenders require a vessel owner to provide them with a C&V before issuing a policy of insurance or lending money and using the vessel as collateral, as the case may be. As for any business, the owner's or operator's skill, performance and experience provide the primary basis, apart form the C&V, upon which the business risks can be assessed. In the case of commercial fishing, safety risks take on a dimension far greater than those in any other industry; as evidenced by the extraordinary casualty rate.

Improvement in fishing vessel safety can be built on a substantial, existing fund of knowledge. The government (primarily through the U.S. Coast Guard and NIOSH), academia, classification societies, and fishermen's organizations, has published mountains of material on steps that can be taken to improve safety on commercial fishing vessels.[3] Potential sources of economic and political pressure to improve fishing vessel safety are limited. A lender's risk of loss due to casualty is ordinarily covered by insurance, thereby reducing its level of concern. Insurers continue to write coverage, leading one to conclude that the fishing vessel insurance business remains profitable even in the face of continuing vessel losses. Congress has declined to regulate beyond the CFIVSA by arguing, in short, that additional regulation would be too expensive. Indeed, it might be argued that both the Death on the High Seas Act, 46 U.S. C. 761, and the Limitation of Liability Act, 46 U.S. C. App. 181-189, aim to reduce financial risks to owners, and, therefore, their insurers.

Background

C&V surveys have long been a component of commercial fishing. In concept, they are empirical examinations of a commercial fishing vessel conducted to establish its condition and appraise its value at the time of the survey. C&V surveys are, for the most part, not conducted on a regular schedule. Instead, they are conducted ➤

when the vessel owner needs to renew a policy of insurance, or at the request of a lender for the purpose of supporting a new loan or continuing an existing loan facility. In addition, a prospective purchaser of a fishing vessel usually has a surveyor of his choice conduct a C&V on the vessel. It should be noted that marine surveyors are not regulated. In final analysis, there exists no uniform standard for the performance of or reporting on surveys of commercial fishing vessels. As a consequence, the reliability of a C&V survey as a tool for evaluating the risks a vessel presents to its owner, master, crew, and others having an interest is inherently suspect.

A surveyor used the following language to conclude a report, after noting that no stability analysis of the vessel had been done:

> "This survey sets forth the condition of the vessel including hull, equipment, machinery, fittings and gear to the best of the surveyors [sic] ability. **This survey was performed without the removal or opening up to expose ordinarily concealed spaces, without taking borings, ultrasonic or audible soundings to determine thickness or soundness of structures or members; the use of moisture-testing equipment to determine moisture content; testing for tightness, trying or testing machinery and/or equipment for proper function ad [sic] operation.** This survey represents **the honest and unbiased opinion of the surveyor**, but in submitting this survey, it is understood by all parties that such a survey is not to be considered a guarantee of its accuracy, nor does it create any liability on the part of the surveyor or its agents arising out of reliance on the information contained herein. [Emphasis added.]"

Such language presents two questions. The first is, "Why bother with getting a survey at all?" if the report itself both is cursory and disclaims its accuracy. The answer is that it establishes a paper record of some sort, but it is not valuable for anything else.

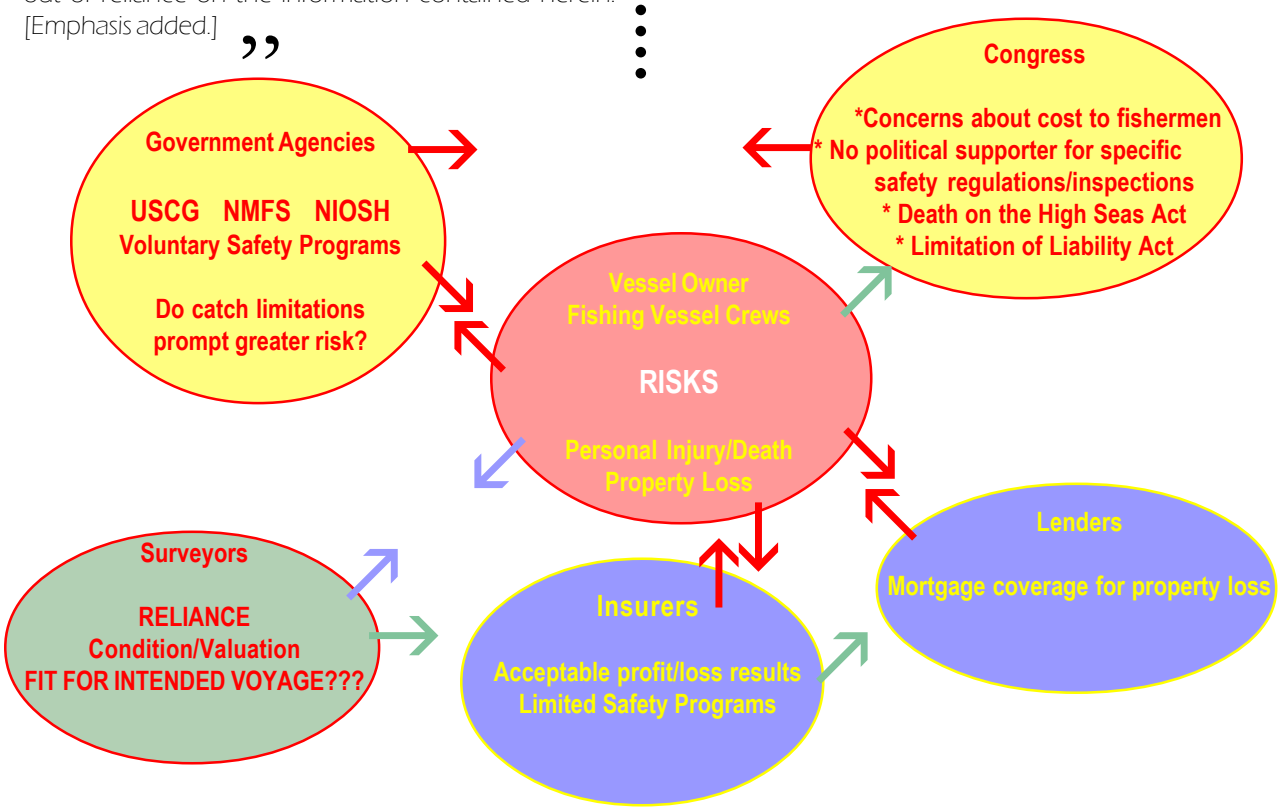
The second question is, "What if, in fact, someone relies on the survey, takes the vessel to sea and suffers a casualty resulting form some reasonably discoverable condition that the surveyor did not report?"

The Necessary Scope of the Surveyor's Undertaking

Generally stated, courts are reluctant to allow the shipowner to evade or pass off their historic primary duty to furnish a seaworthy vessel. Even so, a surveyor is charged with the duties of (1) detecting all perceptible defects of the vessel during the survey; (2) using due care in making recommendations; and (3) notifying the owner thereof.[5] In addition, disclaimers made by surveyors or classification societies in survey reports and documents exculpating them from liability are generally not enforceable.

Once that standard is applied, the scope of the surveyor's obligations can be viewed as expanding dramatically, particularly when reviewed in the context of the far more complex and therefore more dangerous fishing environment.

In the seminal case of *Mitchell v. Trawler Racer*[6], in which a fisherman was injured after slipping on a railing covered with fish spawn left there after unloading, the Supreme Court noted that "the decisions of this Court have undeviatingly reflected an understanding that the owner's duty to furnish a seaworthy ship is absolute and completely independent of his duty under the Jones Act to exercise reasonable care..." The majority concluded: "...The duty is absolute, but it is a duty only to furnish a vessel and appurtenances ➤



reasonably fit for their intended use. The standard is not perfection, but reasonable fitness; not a ship that will weather any conceivable storm or withstand every imaginable peril of the sea, but a vessel reasonably suite for intended purpose."

The standard for the suitability of appurtenances is found in *The T.J. Hooper*,[7] where a tug was found to be unseaworthy for not having a radio to receive weather reports, even though it was not the practice in the towing industry at the time for vessels to be so equipped.[8]

Accordingly, it is quite clear that a more thorough approach to the C&V surveys must be implemented so that C&V surveys of commercial fishing vessels provide the owner or underwriters, particularly those of protection and indemnity coverage, with a categorization of all perceptible defects of the vessel. In today's fishing world, surveyors must evaluate safety, navigation and communications equipment, "intangibles" such as stability, and even crew training to determine if any of these elements present perceptible defects to be resolved in the Owner and Captain's mind before the vessel sails.

In these circumstances, surveyors should be held to the depth or quality of reports comparable to those in other industries where businesses retain independent evaluators to audit, evaluate, or troubleshoot the financial, operating or administrative components that are material to the safe prosecution of a fishing voyage.

Improving Today's C&V Reports

In the ordinary case, a C&V will contain a description of the vessel, describing in general terms the condition of the hull and machinery, list the electronics and safety equipment aboard, and, perhaps report on the skill and competence of the captain. Most importantly, the report provides a value of the vessel, which is vitally important to financiers, insurance brokers and underwriters. Unfortunately, the value alone often drives the business decisions while the substance of the report is of only limited relevance to those decisions.

The usual C&V survey focuses on the physical condition of the hull, plating, and framing. Recommendations regarding material that need to be cropped and renewed are prevalent, as are evaluations of the quality of the coatings. In addition, if the vessel is hauled, the C&V will report on the condition of stuffing boxes, rudderpost packing, through hull fittings, and other under-water appurtenances.

Machinery will be reviewed for age, general condition, cleanliness, fastening of flanges and couplings, and other tangible or perceptible conditions observed without tearing down any of the equipment. But, there is no documentation that the machinery operates in accordance with manufacturer's specifications. A similar evaluation is done on fishing equipment, including winches, booms, and other equipment for handling fishing gear.

The C&V will provide a listing of electronics for navigation and communications. But, again, there usually is no determination made as to the proper operation for the equipment. Importantly, the C&V should (but may not) examine the emergency rescue equipment required by 46 CFR Part 28.[9] And, few surveyors make recommendations regarding compliance with the training and familiarization requirements in those regulations. Further, in many cases a C&V survey will state that a vessel is "fit for its intended service" without ever having described what the intended service is. [See *Mitchell v. Trawler Racer* above.]

It is fair to say, therefore, that the tangible qualities of the vessel are reviewed. However, both through testimony and anecdotal evidence, there are too many circumstances where either (a) a surveyor will prepare a punch list of work that needs to be done on the vessel and makes conclusions about the fitness of the vessel for sea, based on the assumption that the work will be carried out; but, there is no recommendation for a follow-up survey, or indication that a follow-up survey was conducted;[10] or (b) a surveyor sees a vessel while it is in a shipyard, either hauled or in the water, undergoing repairs and anticipates the completion of the work in a good and satisfactory manner without reporting that the vessel is, in fact, in a work-in-progress condition.[11] In either case, the C&V is not valuable for the purposes of assessing the condition of the vessel, or its fitness to go to sea, or as an insurable risk, because there would be no "independent" evaluation of the vessel as completed.

More importantly, the usual C&V does not deal with issues of stability or structural integrity. In reviewing the laundry list of those matters that are reviewed by the surveyor, one can ascertain from the C&V whether the equipment aboard was designed to both alert others of the casualty and to enable the crew to withstand it. The greatest risk to any fishing vessel at sea is water entering the hull, thereby impairing its ability to float, and, because the usual C&V does not address questions of stability or the adequacy of the scantlings of the vessel, one can draw no safe conclusions about the seaworthiness of the vessel from such reports.

Properly done, each vessel should be evaluated for intact, reserve, special conditions, icing, pumped catch, and other conditions that would impair its stability. The surveyor should conduct a comprehensive review to ascertain that there is sufficient compartmentalization, watertight openings are provided for all compartments, and the vessel itself has sufficient capacity to withstand any number of potential impairments of its stability or seaworthiness. The vessel should be provided with a stability book (instructions) that "provide the master or individual in charge of the vessel with loading constraints and operating restrictions that maintain the vessel in a condition that meets applicable (appropriate) stability requirements.[12]

Recommendations

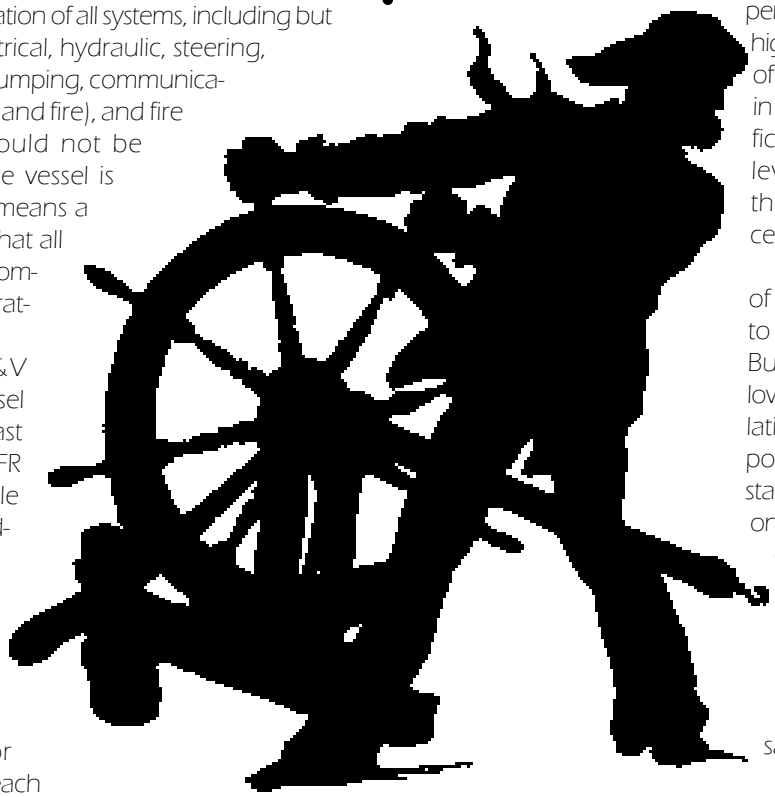
In considering all of the above, it is our recommendation that a ➤

C&V survey of a CFIV should follow the ABS Guide for Building and Classing Fishing Vessels (May 1989), and applicable American Society for Testing and Materials standards: volume 01.07 "Ships and Marine Technology," volume 3.03 "Nondestructive Testing" and volume 3.02 "Wear and Erosion: Metal Corrosion" and other applicable standards.

The C&V should pay particular attention to structural integrity, stability, and watertight integrity, and should document the adequacy and proper operation of all systems, including but not limited to propulsion, electrical, hydraulic, steering, fuel, water, mechanical, bilge pumping, communications/navigation, alarms (bilge and fire), and fire extinguishing. The C&V should not be considered complete until the vessel is "ready for sea",[13] even if that means a "follow up" survey to ensure that all recommendations have been completed and all systems are operating properly.

In addition, the C&V should document that the vessel is in compliance with all Coast Guard regulations for CFIV (46 CFR Part 28) and other applicable Coast Guard regulations, including, but not limited to pollution prevention and the Navigation Rules, and specifically referring to safety training, safety orientation and required drills.

In this context, it would make great sense for insurers and lenders to require each vessel owner or operator to certify that the vessel is in compliance with applicable standards, supported by the independent evaluation of the Marine surveyor.[14] This process is not unlike a business owner providing financial statements, reviewed or even audited by a certified public accountant, before obtaining financing. Because voluntary inspections under the Coast Guard's program reach less than 10 percent of the fishing fleet, and the insurance and banking industries are involved with 40 to 50 percent of the fleet, "market penetration" would be dramatically higher. In addition, the participation of the owners and crewmembers in the review process prior to certification would serve to raise the level of consciousness among those most to benefit from the certification process.



There is no doubt that the cost of this approach will be passed on to the fisherman or vessel owner. But, relative to the risks, the cost is low, and absent government regulation, there is no other pressure point to effect change. Once the standard is set, the remedy may only be litigation ~ but it would take only a few cases of holding surveyors liable for failing to detect and report perceptible defects to reshape the surveying process, and the need for improvements in fishing vessel safety would be well served.

1 Marine Casualty Report, Uninspected Fish Processing Vessel, *Aleutian Enterprise*, Flooding, Capsizing and Sinking in the Bering Sea on March 22, 1990 with nine persons missing and presumed dead. Report dated, November 6, 1991, page 134.

2 Codified at *inter alia* 46 U.S.C. §§4502, 4506, 6104, 10603

3 For example: U.S. Coast Guard NVIC 5-86, 46 CFR Part 28; North Pacific Fishing Vessel Owners Association Vessel Safety Manual; National Cargo Bureau Stability for Fishermen; NIOSH, Commercial Fishing Fatalities in Alaska, Current Intelligence Bulletin 58, September 1997

4 *Caveat emptor*. One organization of marine surveyors, after describing the nature and purpose of surveys, takes the following position: "Once you retain the surveyor, he or she works only for you and reports to no one else. The surveyor is there to protect **your** interests." (emphasis in the original) www.marinesurvey.org/samsfaq.html

5 See generally, Miller, *Liability of Classification Societies from the Perspective of United States Law*, 22 Tul. Mar. L.J. 75 (1997); Beck, *Liability of Marine Surveyors for Loss of Surveyed Vessel: When Someone Other than the Captain Goes Down with the Ship*, 64 Notre Dame L. Rev. 261 (1982); C. M. Davis, *Maritime Law Deskbook,* 316-319 (2000 Supp.)

6 362 U.S. 539, 80 S.Ct. 926, 4 L.Ed. 2d 941 (1960)

7 60 F.2d 737, 740 (2nd Cir. 1932), *cert. den*., *Eastern Transp. Co. v. Northern Barge Corp*., 287 U.S. 662, 77 L. Ed. 571, 53 S. Ct. 220 (1932).

8 *See also*, *Stevens v. Seacoast Company, Inc. and M/V Elena S*, 414 F.2d 1032, 1039 (5th Cir. 1969).

9 Requirements for Commercial Fishing Industry Vessels.

20 Marine Casualty Report, Investigation into the Circumstances Surrounding the loss of the Commercial Fishing Vessel *Adriatic*, O.N. 579941, Eight NM East of Barnegat Light, New Jersey on January 18, 1999 with the Loss of Four Lives. Report dated August 4, 2000, page 31.

11 U.S. Coast Guard, Investigation into the Sinking of the F/V *Two Friends* on January 25, 2000, Transcript, Day Two, February 2, 2000, Pages 361-362.

12 46 C.F.R. Part 28 Subpart E.

13 That is, to fish on the Flemish Cap in October or in the Bering Sea in April.

Safety Management Onboard Icelandic Fishing Vessels

by Gunnar Tomasson, ICE-SAR Icelandic Association for Search and Rescue

The number of accidents onboard Icelandic ships and boats between 1984 and 1997 vary from about 400 accidents per year to about 630. It is fair to say that, annually, one out of every 10 Icelandic seamen at work becomes the victim of an accident.

The number of work-related accidents and others decreases very slowly. Research indicates that by far, most of the accidents occur as a result of human error and the adoption of new technology. This is why there exists a great need for carefully planned internal control in respect of seamen's safety measures and a need for greatly increased education among seamen on accident-prevention measures and safety.

Every year, ICE-SAR Icelandic Association for Search and Rescue's costs from accidents at sea amount to millions of Icelandic crowns. A reduction in the number of accidents is, of course, a matter of great interest, not only to the seamen and their immediate families, but also to the fishing companies and the whole Icelandic population, which shoulders a vast part of the high costs resulting from the accidents.

This decade has seen great efforts in terms of the collection and registration of data on accidents at sea, their number, causes and consequences. But more needs to be done. If we want to decrease the number of accidents at sea it is more essential than ever to make good use of such data.

ICE-SAR has proposed the use of a coordinated safety control system onboard Icelandic fishing vessels in order to decrease the number of accidents. We have introduced this concept to the national authorities. Together with ICE-SAR, the organizations of fishing vessel owners and the seamen have sent a resolution to the authorities to the effect that they are prepared to cooperate with the authorities on the establishment of a safety control system. Additionally, ICE-SAR has obtained cooperation by the Marine Research Institute of the University of Iceland in formulating such a safety system for seamen. The concept has been well received by everyone. The Minestry of Transport and the National Research Council have agreed to provide financial support for the project.

The objective of the safety system is to set up a certain arrangement regarding security procedures and strategies on board the fishing vessels and boats. This system is intended to meet all provisions of Icelandic laws and regulations pertaining to the safety of seamen, as well as meeting international standards, which the Icelandic authorities have acknowledged. The system is to be based on international safety systems and should increase the internal safety control of the crews and the fishing companies. This is to be a coordinated system with the same principal rules of procedure applying onboard all ships and boats in respect of responsibilities and the division of duties. This facilitates the seamen knowing that even though they change ships the same safety system applies to it as with the previous one. The safety system will include the procedures of all the main work factors onboard every ship and boat, and it will ensure regular and well-organized education and registration within the framework of the safety control measures. The system is also to entail confirmation of the safety rules being honored and that improvements are made when needed. This system will be tried on board up to 20 ships and boats of different sizes and make. The main objective is, of course, to make seamanship safer and to prevent injuries to the crew and damage to property.

This year and last, Ingimundur Valgeirsson, who is studying civil engineering at the University of Iceland, has worked on this project on behalf of ICE-SAR and the university's Marine Research Institute. His Master's thesis will be on safety control systems for seamen. Valgeirsson has collaborated with the crews and owners of both a large modern freezer trawler and a smaller line vessel. Three more vessels have already been taken into this cooperation for research purposes.

A decision was made from the very beginning to carry

Photo courtesy Gunnar Tomasson.

out hazard analysis according to Hazard Analysis Critical Control Points. HACCAP is used for monitoring the quality, hygiene and health of the fish products onboard ships; hence the seamen are quite familiar with the system. It entails that seamen write descriptions of all work factors onboard, including when a vessel leaves port, and procedures during its voyage and the fishing, which in turn includes trawl, net, seine and line fishing, fish processing, the arrangement of the catch onboard, work in the hold, arrival in port, loading and unloading, etc. A joint assessment is then made of the control points, control frequency and the desirable guidelines.

A detailed study will be made of the high-risk accident points on board the ships. A registration of all work procedures in cooperation with trained researchers and experienced seamen should reveal which points, work procedures and circumstances are hazardous. Accident statistics will also be used in this respect. In addition to finding the hazardous locations onboard, other conditions must be studied, including the effects of weather, light, freezing, etc., the objective being to reduce the risk of accidents. A study must also be made of the effects of fatigue, long working hours and even cold weather in regard to the causes of accidents. What is the effect of human relations in this respect? Do misunderstood instructions cause accidents? In which circumstances? What improvements can be made? What is the impact of the equipment used onboard in terms of accident risks? What is the impact of work procedures? This list of questions could easily be extended. Collaboration has taken place with the Icelandic Maritime Administration, the Occupational Safety and Health Administration, and classification societies on the various control factors, control frequency and guidelines. These institutions have already contributed to the preparation of descriptions and guidelines for the control points.

According to law, the captain is fully responsible for the safety onboard his ship and this does not change, although the implementation of the safety system will systematically distribute the responsibility among all crewmembers, the fishing company and the service parties.

Safety committees will be appointed onboard the ships. Their role is to ensure that the system is indeed used and that it works. The safety committee of each ship will receive suggestions by the crew, for example, on risks and control points. The committee will decide who shall carry out the control, when and how frequently. The captain may request the committee to receive a newly recruited crewmember and, in turn, the committee may appoint a special representative, an orientation supervisor, to act in a capacity as the recruit's personal temporary instructor and consultant. The representative will show the new crewmember the ship, the locations of safety equipment and introduce the safety rules onboard the ship. The new crewmember will receive a booklet showing the details of the ship, as well as containing work descriptions, information on the safety system and highlighting the main hazards onboard. It is highly important that the safety committee enjoys the trust and support of the ship's management. The safety committee will hold meetings with the crew and the owners as often as deemed necessary to discuss the main safety factors onboard and to dispatch requests regarding repairs and improvements of the ship. The relevant fishing company and the ship's service parties ashore must take active part in the ship's safety system, which is something the safety committee must follow up on.

The efforts currently taking place are essential basic work, which will certainly be useful to all ships and boats deciding to carry out the safety system. It is quite likely, however, that the system will have to be adjusted to every single vessel. Additionally, it is necessary to computerize the system in order to facilitate improved control and accumulation of data.

The accident statistics of seamen cover a large number of accidents taking place at harbors in Iceland. ICE-SAR strongly urges for rules being implemented that will improve harbor safety and, needless to say, the safety control system for seamen should apply to all Iceland harbors.

As previously stated, the objective of this project is for the safety system being adopted and carried out by the entire Icelandic fishing fleet. The IMO already requires commercial vessels to abide by the International Safety Management Code and experience shows that the requirements made of commercial vessels today will sooner or later be made of the fishing vessels. Today, our objective is to structure and implement a safety system for fishing vessels. The system must not only meet all the requirements made of commercial vessels, as it must also include a detailed safety control system onboard the fishing vessels. Additionally, the safety system will be laid out in such a fashion that it can easily be translated into foreign languages and adjusted for use onboard foreign fishing vessels.

Understanding & Preventing Lobstermen Entanglement: A Preliminary Survey

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PHOTOGRAPHS BY Earl Dotter, Alicia Patterson Foundation Fellow, 1999-2000; Ann Backus, Harvard School of Public Health; Rick Kelly, NIOSH Alaska Field Station

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Background

Commercial fishing has been recognized as a hazardous occupation for centuries. Sir Walter Scott wrote in "*The Antiquary*," "It's no fish ye're buying, it's men's lives."[1] The working conditions for commercial fishermen are very dangerous and factors associated with commercial fishing deaths are complex. Gear type, fatigue, and environmental conditions contribute to the severity and frequency of these incidents.

By the mid-1980s, hazards in the commercial fishing industry captured the attention of Congress, which enacted the Commercial Fishing Industry Vessel Safety Act of 1988. During 1990-1995, the CFIVSA required fishing vessels to begin carrying specific safety and survival equipment. It also required certain crewmembers to have training in first aid and how to conduct emergency drills on fishing boats. However, deck safety was not addressed by these regulations.

Between 1993-1997, the average number of lobster licenses of all classes issued annually by the Department of Marine Resources in Maine was 5,681[2]. The occupational fatality rate for lobstermen was 14 per 100,000 licensed lobstermen[3], more than 2.5 times the national average for all industries (4.8 per 100,000) Between 1993-1999, seven lobstermen drowned after falling overboard.[4] Conditions on the boats suggested that trap rope entanglement was a likely cause[5]. Anecdotal reports indicate that the prevalence of the entanglement of lobstermen in trap rope is high. When they become entangled in trap rope, they can be pulled into the water and often are not able to free themselves from the rope.

Lobsters are fished by placing a baited, rectangular mesh trap (size: 0.5 m by 0.5 m by 1.0 m, and weighing 2-4 kg) on the sea bottom (5-20 meters deep) connected to a surface buoy by a "trap rope". Up to 10 traps may be connected to the same rope. Traps are periodically pulled into a boat using a winch (pot hauler), the trapped lobsters are removed, and the trap is cleaned of debris and rebaited.

FOUR BASIC ACTIVITIES ASSOCIATED WITH LOBSTERING

- **buoy pick-up - the buoy is gaffed, and the trap rope is placed in the pot-hauler (winch)**
- **freeing snarls - gear caught on another set of traps is untangled**
- **setting gear - lobster traps are baited and thrown overboard;**
- **shifting gear - a large number of lobster traps are hauled-up and transported to another fishing ground**

This study was undertaken to gather data on the prevalence of personal entanglement in trap rope, to understand the work practices associated with entanglement, and to learn from fishermen what work practices and engineering controls would 1) reduce the risk of entanglement, 2) help lobstermen escape from an entanglement, and 3) facilitate reboarding in the event that a lobsterman was pulled overboard from an entanglement.

Methods

An interview guide for this cross-sectional study was developed and piloted with lobstermen. The guide consisted of eight sections: (1) Background Information, (2) Description of Lobstering Practice, (3) Description of Vessel, (4) Entanglement Likelihood and Circumstances, (5) Interventions, (6) Other Devices, (7) Personal Entanglement Accident History, and (8) Communications.

Five people were trained to use the interview guide and 103 lobstermen were interviewed. The interviews took place from October 1999 through September 2000. In most cases, the lobstermen were interviewed privately. Interviewers did not collect any information that could be used to identify participants. ▶

Results

Of the 103 lobstermen interviewed, only one was female; 93 were captains and 10 were sternpersons. Fifty-two percent reported "always" fishing with a sternperson, while 2 percent reported "sometimes" and 22 percent reported "never" fishing with a sternperson.

Also, 73 percent answered "yes" to the question "Have you ever been caught in trap rope where you lost clothing, were pulled to the stern, or pulled overboard." Forty-four percent of the 103 lobstermen reported a total of 90 entanglements within the last five years (see Figure 1).

Number of events	Number reporting	Total events
1	20	20
2	14	28
3	7	21
4	2	8
5	1	5
8	1	8
TOTALS	**45**	**90**

Figure 1. Number of lobstermen entanglement events in the last five years.

Eighty-one percent of the lobstermen interviewed said that entanglement was either "likely" or "very likely" to happen when setting gear, and 68percent said entanglement was either "likely" or "very likely" while shifting gear (see Figure 2). Freeing snarls and picking-up the buoy were described as "not likely" settings for an entanglement by 67 percent and 94 percent, respectively.

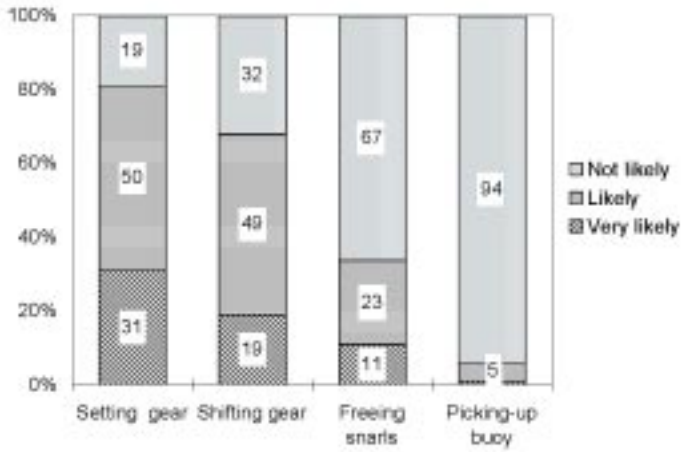


Figure 2. Likelihood of entanglement for each of the four lobstering activities.

Figure 3 shows that rope accumulates at the feet of the lobsterman as he is setting traps. When he is ready to set the traps he pushes the first trap overboard and the remainders follow, with the rope paying out over the side of the boat at considerable speed. The setting gear activity is generally more dangerous if the captain (as is the practice) has placed the boat in forward gear.

Interventions suggested by lobstermen that might reduce, and presumably prevent, entanglement included both work practices and engineering controls, the two categories of interventions typically found in industrial settings. Regarding their work practices, lobstermen mentioned "working slowly," paying close attention, knowing where the rope was at all times, using "common sense," keeping hands and feet away from rope as much as possible, and positioning people carefully during setting and shifting activities.

Figure 3. Peter Eaton hauling a single lobster trap.

When lobstermen were asked to determine whether eight engineering interventions we listed would be "not useful," "useful," or "very useful" in preventing entanglements or aiding in self-rescue from an entanglement, they were clear and largely in agreement that non-skid mats, a washrail above the knee, a high-traction deck surface, and either a rope locker or a rope bin are engineering controls that would be useful in reducing the risk of entanglement.

When asked to make a choice among eight means of escaping from an entanglement, 95 percent of those interviewed said having a sternperson would offer the best hope of escape. The second, third, and fourth choices were wearing a knife (25 percent), having a knife mounted in the stern (18 percent), and having a gag line (remote engine shut-off) (15 percent).

When asked to choose among four means of surviving an overboard incident and being able to reboard the boat, 98 percent ranked having a sternperson as their top choice. Loose clothing (77 percent), ladder or scuppers for footholds (76 percent), and a life jacket (60 percent) were ranked second, third, and fourth.

Discussion

With 73 percent of the respondents reporting that they had experienced a serious entanglement in trap rope at some time in their fishing career, it is evident that this is common in the lobster fishery. When asked to explain the circumstances, lobstermen reported a variety of circumstances leading to entanglement. One man fishing alone had the trap rope wrapped around his ▶

left wrist and was pulled into the water. He was able to cut the rope, but had no flotation device and was rescued after another lobsterman saw his boat circling aimlessly 45 minutes later. One man told of hailing a passing boat while lying prone on the deck of his boat. Others were fortunate enough to have had a sternperson or a knife, or the strength to hold on to the wheel long enough to take the boat out of gear.

This study delineated four major components in the strategy to prevent entanglement and facilitate recovery from the event: **1) control** the environment including the ropes, **2) stop** the force including cutting the engine, **3) rescue** by untangling or cutting the rope, and **4) re-enter** the vessel if pulled overboard.

Figure 4. Rope locker (deck platform open) shows rope collecting under the deck away from the fisherman's feet.

Rope control can be achieved through "engineering controls" such as installing an under-rail rope bin or an under-deck rope locker or by using a fairlead. More than two-thirds of the lobstermen indicated that a rope locker or rope bin would reduce the risk of entanglement. However, during this study, the interviewers only found two lobster boats with these devices. A rope locker (see Figure 4) is a water-tight compartment built under the flooring with openings under the pot-hauler and along the rail so that rope coming off the pot-hauler will drop into the compartment under where the lobsterman stands and will be completely out of his/her way. These lockers are particularly useful for lobstermen who fish 10 trap trawls (10 traps on a length of rope between two lobster buoys) because these trawls involve the use of much more rope than fishing a single or double per set.

Nonskid mats reduce the chance of slipping into the rope pile and increase the chance of retaining or regaining balance when caught in the rope. The deck surface tends not only to become wet, but also slimy when seaweed and algae arrive on board with the rope and traps. For similar reasons, a high-traction deck surface is useful. Some lobstermen improve the traction on their entire deck surface by having their decks painted with an abrasive-containing paint. Nonskid mats are often used along with high-traction deck paint.

Figure 5. Rope bin made of plywood with a piano hinge that allows it to drop open and accept trap rope from the pot hauler.

The rope bin is a simple hinged door device that allows the rope to fall into a compartment under the washrail, but above the deck. The door, as simple as a plywood panel hinged along the deck-side edge, keeps the rope away from the feet of the lobsterman (See Figure 5).

A fairlead, in the form of a bucket or pipe, set on or mounted through the washrail was deemed "useful" or "very useful" by 51 percent of those interviewed. This device controls the rope by guiding it back into the water before it has a chance to run to the stern, and thereby reduces the floor space occupied by rope to a small corner near the pot-hauler. The fairleads in use were in some cases buckets filled with water, and in others were an iron or PVC pipe, or a spaghetti-like bundle of fiberglass rods mounted through the washrail. This last invention had the benefit of being flexible in the event that a person was thrown against it during a sudden shifting of the boat or an entanglement accident (See Figure 6).

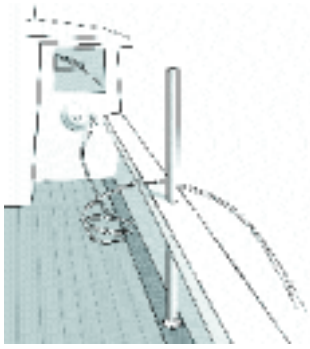


Figure 6. A fairlead made of a steel pipe or a collection of fiberglass rods mounted into the deck that "leads" rope out of the boat and minimizes the area where rope could be a hazard.

The importance of the washrail height as a means to reduce entanglement and especially lessen the potential of being pulled overboard is well understood by lobstermen. Ninety-five percent said that a washrail (washboard) above the knee was "useful" or "very useful" in reducing the risk of entanglement. While hauling and setting, lobstermen tend to lean on the washrail. A rail that is high, *i.e.*, above the knee and almost at mid-thigh, provides significantly more support against the loss of balance and provides a better barrier to being pulled overboard.

Once entangled, either a lobsterman loses a glove or boot, has to struggle to loosen the rope, or has to cut himself free. If there is a second person on board, the situation can usually be resolved quickly; if not, wearing a dive knife in an accessible location, is extremely important. A dive knife is made of 100 percent stainless steel and should have a hard molded sheath that clips the knife in for safety. Of the lobstermen interviewed, 25 percent answered that wearing a knife was their top choice for escaping from entanglement; 18 percent thought taping a knife at the stern would be their preference. The suggested placement of a knife is handle down on suspenders, such that it is reachable by either hand in one stroke (See Figure 7). In actuality, having knives both on person and taped to the transom would provide the best opportunities to escape.

Figure 7. Lobstermen should keep knives attached to their suspenders, handle down, to free themselves from rope entanglement.

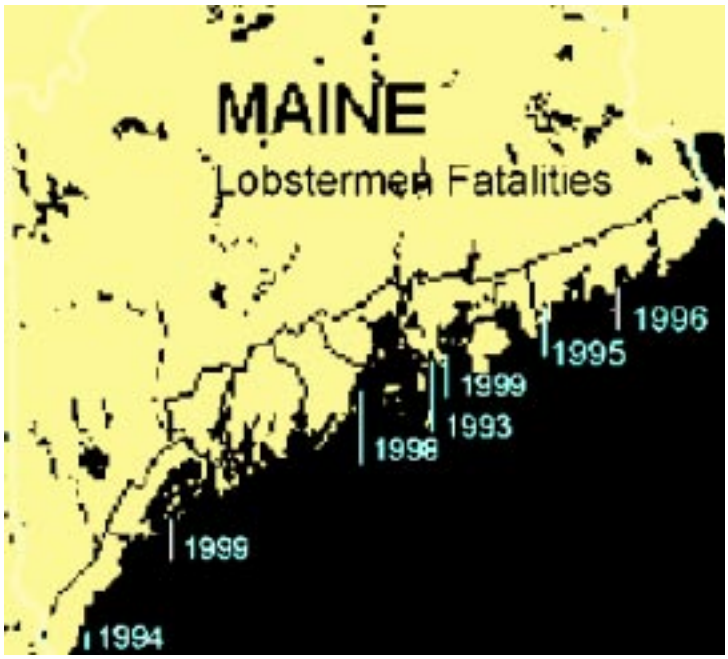
Although only 35 percent of the lobstermen noted that a safety cord or gag line/kill switch that would provide remote engine shut-off would be useful in ▶

reducing the risk of entanglement, a means of shutting off the engine is critical to surviving many entanglement accidents. Many lobstermen either don't think it would come to needing to shut down the engine remotely because the sternperson would be available to manage the helm, or they think such a device would be a nuisance at non-critical times. For lobstermen fishing alone, it may be the only lifeline in a serious situation. A gag line run under the washrail and across the stern, reachable from two sides of the boat, would in fact be out of the way of normal operations but available to pull-on in the event the lobsterman were pulled to the deck or caught at the transom. (See Figure 8). Given that most lobstermen set their traps while in forward gear, a means to stop the engine is the only way to gain slack in the rope. The traps are fast sinking and their weight creates a force on the rope that is too great for the average lobsterman to overcome unless he can cut the rope[6]

Figure 8. Gag line or kill switch for remote engine shut-off.

Captains have the option of taking a sternperson with them, and they do so for various reasons. Probably the most frequent reasons given are productivity and efficiency. Many captains would also cite the safety benefit of having an additional person on board. Choosing to fish with a sternperson has significant positive safety implications. It considerably reduces the risk of a fatal injury because a second person is available to help. However, the risk is not negligible because some sternpersons lack knowledge about the throttle and gears of a boat and could make a fatal mistake. Although this survey did not contain questions regarding how well sternpersons knew the boat and would be able to respond in an emergency, sternpersons should be prepared to step to the helm.

In addition, the interviews associated with this study revealed that few lobstermen wear life jackets, inflatable vests, or suspenders. Thus, staying afloat in the water for a length of time is problematic. Observation of lobster boats shows clearly that few have fittings that would enable a lobsterman to reboard if thrown overboard. Some boats have steps, knotted ropes, or rope ladders and some have scuppers that are large enough for the toe of a boot, but generally the hand- and foot-holds on these boats are noticeably absent. It would be simple for lobstermen to make rope ladders to hang off the non-working side, to install a ladder or steps, or to install scuppers that are large enough to serve as footholds and mount handles for easy reboarding.



1 As quoted in Schiller, SF. "Trawler Fishing: an extreme occupation, PR R Soc Med. 59:405-410,1996.

2 personal communication, Paul Brochu, Harvard School of Public Health, June 2000.

3. "Summary of Fatal Injuries Experienced Within the Commercial Fishing Industry of Maine, 1993 through 1997." U.S. Coast Guard. U.S. Coast Guard Marine Safety Office, Portland, Maine.

4 U. S. Coast Guard. Fatality Files, Marine Safety Office, Portland , Maine.

5 Personal communication, Jeff Ciampa, Marine Safety Officer, U.S. Coast Guard Marine Safety Office, Portland, Maine, September 1999.

6 Olson, S. "Kill the Engine, Save your life." National Fisherman, 1999:Nov. p.42.

COMMERCIAL FISHING VESSEL SAFETY: A UK PERSPECTIVE

by RADM John Lang FNI FRIN, Chief Inspector of Marine Accidents, The United Kingdom

Accident Causes

Only a handful of accidents can ever be investigated in depth by the MAIB, but those that are provide sufficient information for the principal causes to be identified. Once done it becomes possible to do something about improving safety.

Foundering. The most common cause of foundering is flooding due to the failure of seawater pipe systems. The MAIB sees evidence of poor maintenance and neglect coupled with a failure to ensure that vessels have a functioning bilge alarm. From a number of investigations it is also evident that relatively few fishermen know how to contain flooding incidents. Because they frequently discover the flooding too late, those onboard can do little other than request the search and rescue authorities to provide a salvage pump.

Lack of knowledge of stability matters is also a root cause. It manifests itself in a readiness to overload vessels, by adding topweight without consulting a naval architect and routinely leaving weathertight doors and hatches open at sea. There is also widespread ignorance about the effects of free surface: even a relatively small amount of water in the fish hold of a rolling fishing vessel can initiate a capsize.

Watchkeeping standards in many boats are poor, with some individuals failing to maintain a proper lookout. Too many vessels run aground while on passage, either because the watchkeeper has fallen asleep in the wheelhouse chair through fatigue, or he is relying too much on automatic navigation systems.

The most common cause of death among single handed boat operations is drowning. A number of occupants have either fallen overboard or been pulled into the sea by fishing gear. Although impossible to prove, there are indications that some victims would probably have survived had they been wearing lifejackets. In practice, very few fishermen feel comfortable wearing them and are very reluctant to put them on. Although they argue vehemently against their use, an increasing number accept that modern lifejacket designs are compatible with working on deck but would argue they need to be more robust. Few, however, wish to be seen making the case for lifejackets in public.

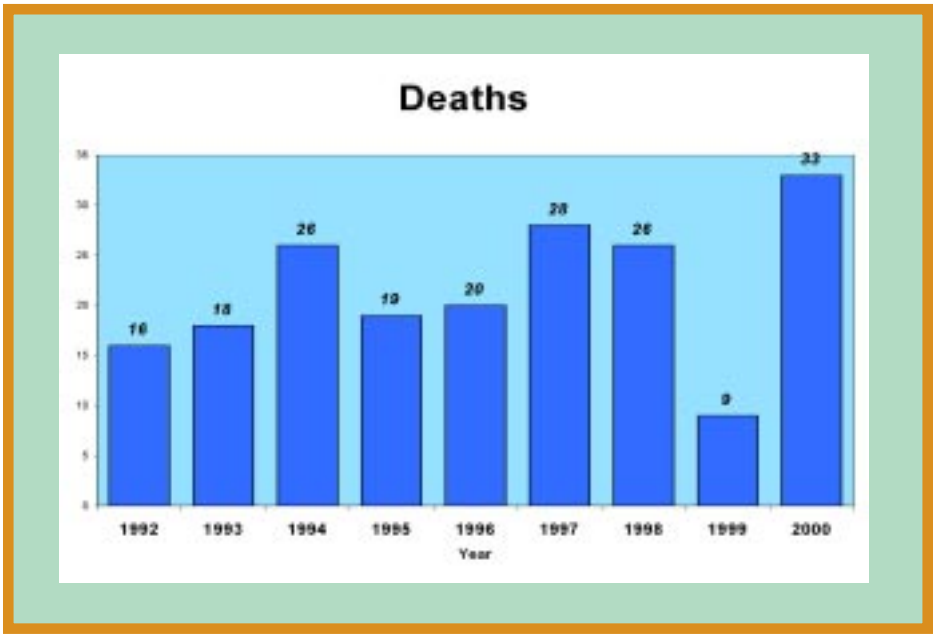
Personal injuries are commonplace but there is compelling evidence in the UK that they are notoriously under-reported. In most cases they are caused by inattention or lack of care with, again, fatigue featuring as an underlying factor.

Introduction

Throughout the world, commercial sea fishing is recognized as one of the most dangerous of all industrial occupations. The United Kingdom is no exception.

The British industry embraces a multitude of sectors from single-handed crab and lobster fishing, to large-scale pelagic and white fish undertakings. It tends to be very fragmented with many fishermen operating as skipper owners. With a few exceptions, most organizations engaged in the process of catching fish do so without any formal management structure. Many local economies, often in remote places, are heavily dependent on "the fishing."

Because the UK is part of the European Union, its waters are now open to fishermen of other nations. This has led to too many fishermen hunting too few fish, and the introduction of widespread conservation measures. Commercial sea fishing is now recognized as a particularly troubled industry with many of those involved suffering greatly. Many now find the economics of maintaining their boats and equipment very expensive while fewer young people are prepared to go to sea and earn a living in this harsh environment.



Against this unpromising background, the safety of the industry is not good. The UK's Marine Accident Investigation Branch (MAIB) is responsible for both collecting data on the many accidents that occur every year, and also for investigating with the specific aim of identifying the causes and recommending measures to improve safety.

Fishing Safety - The Record

Between 1992 - 2001, 279 UK fishing vessels were lost and 197 fishermen were killed.

During this time, the number of registered fishing vessels steadily reduced as conservation measures and a licensing system were introduced. Despite this, the number of accidents remained obstinately constant. This, in turn, meant the accident rate worsened rather than improved.

The Underlying Reasons

The MAIB is committed to establishing both the causes of so many accidents, and to understanding why they happen. Much of its effort is devoted to identify the underlying reasons.

It is extremely difficult to prove that a link exists between the high number of accidents and the economic fragility of the industry, but there is circumstantial evidence to show that when owners and skippers face economic hardship, they skimp on safety. This manifests itself in a number of ways including paying scant regard to effective maintenance or ensuring life saving apparatuses are in good order and in date.

Although there is undoubtedly a connection between economic hardship and safety, few investigations show that shortage of money is ever a primary cause. Many of the observed accidents could, and should, have been prevented without incurring any great expense. Evidence in other investigations confirms that expenditure on safety was not as good as it should have been but that lack of money was not the problem; the money had been spent on other things.

With one or two possible exceptions, the fishing industry is adequately regulated but, for a number of reasons, enforcement is not as rigorous as elsewhere in the marine sector. Relations between regulator and parts of the industry can be fragile and there are a number of occasions when an apparent agreement has been reached only to break down in recriminations when a vested interest is threatened. ➤

Photo courtesy RADM John Lang.

> Against this background, a safety culture is strangely elusive and accident investigators routinely find a conspicuous lack of safety awareness among many fishermen.

Two initiatives are being taken to improve matters in the UK: the introduction of formal safety assessments, and better training. Safety assessments are still in their infancy and have much to offer but early indications show that a number of fishermen go through the motions of completing them and do little to implement appropriate measures to overcome the identified hazards.

Despite promising measures being introduce to provide more effective training, many of the young going to sea for the first time regard training as no more than a means of acquiring the appropriate piece of paper. It is a sad reflection on an industry where bad practices are all too easily perpetuated and the need for training is so badly needed.

It would be tempting to conclude that changing the attitudes of a centuries old industry is too difficult or even impossible. Few would argue however, that the accident rate among fishermen is far too high or that the toll on both vessels and people is intolerable.

Something must change.

The Solutions

The MAIB believes that no single authority or organization can effect the necessary change. It can, however, be done if everyone is committed to achieving it; government, the industry, the fishermen and, crucially, the families.

Although there is scope for improving some of the regulations and reviewing the sustainability of the British fishing industry, the more pressing requirement is to improve the education and training of those who go to sea to catch fish. Others may argue for equipment grants but **even the best safety equipment is useless if people do not know how to use it**. There is, for example, abundant evidence that a number of fishermen have little idea how to use the safety equipment onboard their vessels.

The MAIB has little doubt that better training is fundamental to improving safety but notes that fishermen are very sensitive to anyone trying to impose their will on them if they do not know the business. They will pay scant attention to, for example, a master mariner who has never been to sea in a fishing vessel. In the author's opinion the best training is provided by fishermen themselves. Any investment in training fishermen to become the trainers is, in the opinion of the MAIB, likely to be pay handsome dividends.

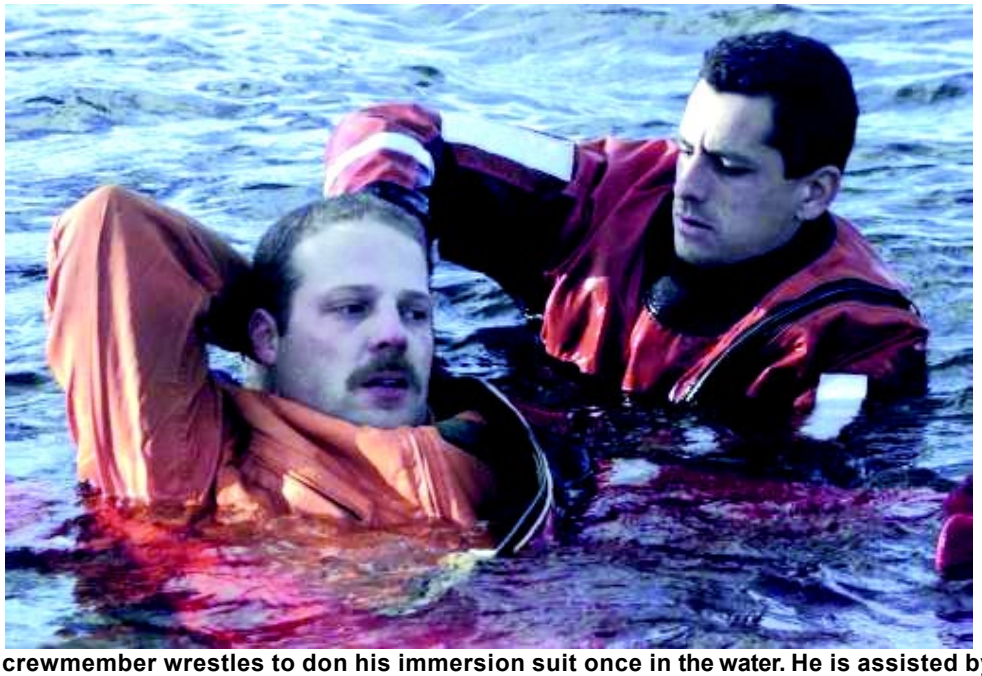
There is evidence to show that the families of fishermen are among the greatest proponents for improving safety. They tend to be the people who mourn the most and suffer the greatest hardship when people are killed or injured. If they can be encouraged to persuade those who go to sea to think safety, to learn from the errors of the past and to insist on greater care being taken, then we may see a sustainable improvement.

Summary

There is no arguing that fishing is a very dangerous occupation and is terribly unforgiving of any carelessness or neglect.

There is an overwhelming need to improve safety and develop a safety culture in the industry. This paper argues that the most effective way of achieving this is through training and a partnership between government, the industry, crews and families.

Until greater attention is paid to safety, the high accident rate will continue with its consequential toll on vessels, the people who sail in them, and the families left behind.



A USCG crewmember wrestles to don his immersion suit once in the water. He is assisted by another crewmember after having difficulty. USCG photo by PA2 Keith Alholm.

The Sinking of the Carol

by Rob Lee, F/V Examiner, MSO San Francisco Bay

The following is a summary of investigative findings on the sinking of the fishing vessel *Carol*. This unfortunate casualty could teach some valuable lessons. Much of the information was compiled from interviews with the survivors.

The fishing vessel *Carol* was a 48-foot wooden boat, built in 1949. This vessel had noticeable water leakage and, according to witnesses, usually operated with minimal freeboard. These factors strongly point to a variety of problems.

On the evening of September 8, 2000 the *Carol* was several miles offshore in the vicinity of San Francisco while transiting north to Oregon. Two crewmembers were below sleeping and the owner was at the helm. While off of San Francisco, a large wave hit the vessel on the port side causing it to roll and capsize. The crewmen were thrown out of their racks. Soon all three persons on board were in the cold ocean without time to prepare, and the vessel was sinking quickly.

In this case, the life raft did not deploy as designed, and due to the rapid turn of events, a radio distress call was never made. An Emergency Position Indicating Radio Beacon signal was not transmitted, which could have immediately alerted the Coast Guard to the crew's position.

The two surviving crewmembers last saw the owner clinging onto an ice chest in the water. Both crewmen were able to grab their immersion suits, but were not able to don them on the ship. One crewman could not fully put his suit on in the water so he tied it around his body to keep him floating. The second crewman successfully donned his suit, and after eight hours of swimming and drifting, made it to shore. He was then able to phone for help using a roadside emergency call box. Initially, the emergency dispatcher thought the caller was drunk due to the effects of hypothermia, and thought the call to be a hoax. Unfortunately, this delayed rescue efforts considerably. It was well more than eight hours after the emergency call was made that rescue efforts were launched.

The crewmember who had to tie his immersion suit to his body was rescued and treated for severe hypothermia. The crewman who was able to properly put his suit on suffered minor injuries.

Interview investigations revealed that the EPIRB was in its original box, stowed in the cabin and never installed. The vessel's life raft was secured with crab line to keep it in its cradle, and this prevented it from floating free when the vessel sank. Eventually, the life raft worked its way loose and deployed well after it was initially needed.

A key to lifesaving is to ensure you have the means to survive the frigid cold ocean and the effects of hypothermia (either an immersion suit or life raft or both). Additionally, the means to communicate your distress (such as an EPIRB or mayday) may greatly increase your chances for rescue. Immersion suits are a critical piece of lifesaving gear. Know how to put it on in and out of the water. EPIRBs are a critical means of relaying your distress and location to the Coast Guard. Make sure your EPIRB is tested monthly and that the battery and hydrostatic release have not expired. Ensure your life rafts are serviced, the hydrostatic release is not expired, and that it is not prevented from floating free if it is stowed to do so.

INCREASING COMMERCIAL FISHING VESSEL SAFETY COMPLIANCE

by LCDR Martin Walker, Chief, Inspection Department, Marine Safety Office, Duluth

The Great Lakes at dusk. USCG photo.

What benefit does a Memorandum of Understanding (MOU) with a few small tribal fishing communities have to do with me? The answer is more of concept than actual documents.

The Native American tribal fishing communities along the south shore of Lake Superior presented a unique challenge to the Coast Guard's commercial fishing vessel safety program efforts, in that it was difficult reach out to the fishermen who are scattered in various remote locations on tribal land. In addition, the tribal community tends to resist Federal regulations that are seen as an infringement on tribal sovereignty. The end result was nearly zero participation in dockside exams offered by the Coast Guard. The solution was an MOU that facilitates self examinations within the tribe. The results have been a dramatic increase in the percentage of examined vessels that is several times the national average.

The key to the MOU was in the preparation. The agreement was not signed until the tribes had laid the legislative groundwork to give the MOU its teeth. A substantial amount of effort went into regulatory discussions with tribal representatives and their collective natural resources organizations, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC). The focus of the discussions was to make a set of tribal regulations that are a perfect subset of their Federal counterparts. The tribes were reluctant to adopt into tribal code items of the Federal Regulations that do not apply to the operating environment of the Great Lakes. The finished tribal regulations, or codes, are a slightly truncated version of the CFV regulations. However, the fishermen, by complying with the tribal regulations, will also comply with the Federal Regulations. A bonus of the tribal code is a provision that the tribes inserted that requires an annual exam. This single provision makes the MOU effective and significant to other areas of the country.

The Great Lakes are different from other regions of the country for many reasons. The high percentage of tribal communities that fish the waters of the lakes are among these distinctions. In fact, the tribal fishermen far outnumber the non-tribal fishermen on Western Lake Superior. The MOUs permit the Coast Guard to concentrate CFV safety efforts on the largest user of the waterway. Clearly a similar approach could be used in other areas that have a large tribal fishing community that is internally regulated (quotas, tribal permits, etc.,). Non-tribal fishermen are usually regulated at the state level. Often the state in which the fishermen reside will require a permit to fish or operate within state waters. Some states may require that a condition of the permit process is to "comply" with Coast Guard regulations. In such a state, it would merely require some interaction with the department of natural resources to bolster their enforcement and raise exams from voluntary to *required* status.

Another important provision of the MOU with the tribes provides for training and acceptance of qualified tribal enforcement officers as dockside examiners. Local training was necessary to field a sufficient number of examiners, given the time and budgetary constraints that existed. The tribal examiners also receive refresher training on an annual basis. In short, the additional exams are conducted with little increase in workload to the unit. Again, this was built-in during the planning stages. Units that initiate action with the states must be prepared for the sudden increase to avoid being caught short of qualified examiners.

The concept of working closely with state and local governments has been a fundamental part of the response side of the Coast Guard for many years. Greater interaction with the fish and game branch of the state department of natural resources may have huge benefits to the CFV program, as well. In addition, the concept of making the Coast Guard a greater part of the state permit process may have other applications, such as increased Drug & Alcohol Program Inspections (DAPI) and Uninspected Passenger Vessel (UPV) audits. In areas that have a tribal presence, the MOU can be an effective way to gain compliance, while improving relations with the tribal governments.

A COMMITMENT TO SAFETY OF COMMERCIAL FISHERMEN

by CWO Gregory J. Schultz, MSO Duluth, Assistant Chief of Inspections


USCG photo.

In June 1999 the U.S. Coast Guard signed a Memorandum of Understanding (MOU) with the Keweenaw Bay Indian Community to improve the safety of commercial fishing vessels on Lake Superior. The MOU formalized a cooperative effort between the Coast Guard and the tribe that began three years earlier. The success of this approach led to the Bad River and Red Cliff bands also signing MOUs with the Coast Guard in June 2000.

The MOUs define the procedures for the Coast Guard and the tribes to share enforcement responsibilities on tribal commercial fishing vessels. For the tribes, this was accomplished by formulating Tribal Code on fishing vessels. The tribal code closely mirrors the Federal fishing vessel regulations. In addition, a clause in the tribal code requires biennial dockside exams on the entire fleet of tribal vessels. These MOUs keep with Federal law and Presidential directives; specifically, 25 U.S.C. 2804, which authorizes agencies to enter agreements with Indian tribes relating to law enforcement. In making such agreements, the President has directed agencies, through Executive Order 13084 to consider "principles of respect for tribal self government and sovereignty, for tribal treaty and other rights, and for responsibilities that arise from the unique legal relationship between the Federal government and the Indian tribal governments."

The MOUs define the procedures for the Coast Guard and the tribes to share enforcement responsibilities on tribal commercial fishing vessels.

The MOUs with the Keweenaw Bay, Bad River, and Red Cliff Indian Communities covers the ceded waters of Lake Superior on which both the Coast Guard and the tribes have concurrent jurisdiction. Under the MOUs, the Coast Guard will forward any violations cited on tribal vessels to the tribal court systems for disposition if an equivalent regulation exists in the tribal code. Additionally, the Coast Guard and the tribes will share information regarding each other's commercial vessel safety programs.

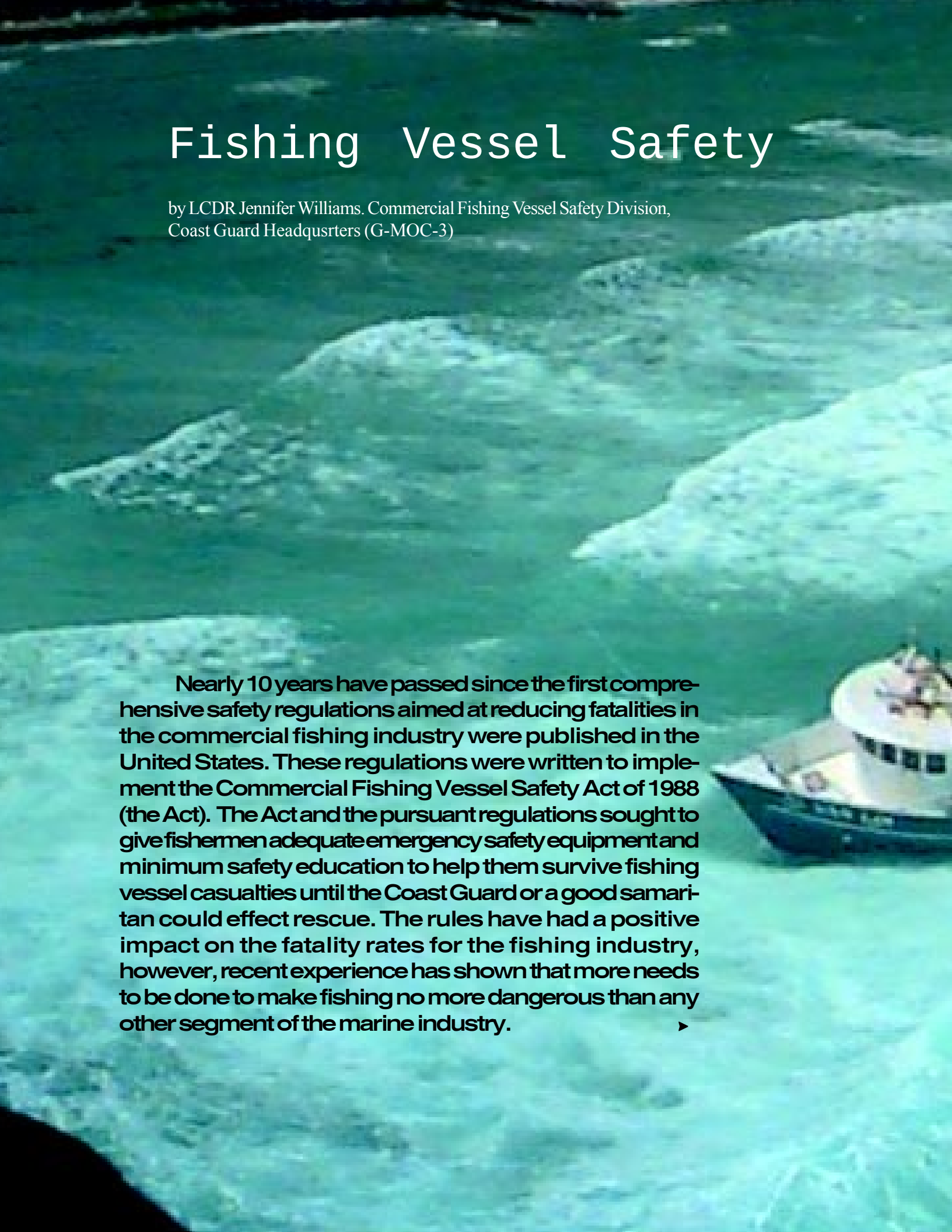
To make the program work, MSO Duluth began an aggressive training program for local tribal examiners. Because of funding constraints that precluded "road shows" and insufficient quotas to resident school in Yorktown, MSO Duluth created an in-house training program. The goal was to train tribal examiners to the same level as other (Regular, Reserve, and Auxiliary) examiners without the benefit of sending them to training at Yorktown. The training subjected tribal examiners to the same standard qualification sheet as Coast Guard examiners. MSO Duluth met the goal of fielding a cadre of qualified examiners in time to examine the tribal CFV fleet during the 2000 season. The qualification of seven tribal examiners is perhaps this year's greatest success story; they will be an enduring resource for years to come.

To ensure the local Coast Guard Stations were kept abreast of all tribal CFVS initiatives the MSO presented training to the stations on the tribal MOUs and termination procedures. In addition, both Station Bayfield and Portage participated in the CFV Dockside Exam training provided to the tribal enforcement officers. This interaction provided a dual benefit for the boarding officers of fostering a better relationship with the tribal enforcement officers and it also gave the boarding officers knowledge of what is checked during a shore-side fishing vessel examination.

MSO Duluth's goal of improving safety of commercial fishing vessel is off to a great start through their education and training approach. In 2000 Duluth saw the total percentage of vessels examined climb from 2 percent in 1999 to 28 percent in 2000, far surpassing the national average of 6 percent. In addition, MSO Duluth commercial fishing fleet has not recorded any casualties since the program was initiated. These significant improvements can be attributed to the cooperative effort and open communications between MSO Duluth and the tribal communities.

Fishing Vessel Safety

by LCDR Jennifer Williams. Commercial Fishing Vessel Safety Division,
Coast Guard Headqusrters (G-MOC-3)



Nearly 10 years have passed since the first comprehensive safety regulations aimed at reducing fatalities in the commercial fishing industry were published in the United States. These regulations were written to implement the Commercial Fishing Vessel Safety Act of 1988 (the Act). The Act and the pursuant regulations sought to give fishermen adequate emergency safety equipment and minimum safety education to help them survive fishing vessel casualties until the Coast Guard or a good samaritan could effect rescue. The rules have had a positive impact on the fatality rates for the fishing industry, however, recent experience has shown that more needs to be done to make fishing no more dangerous than any other segment of the marine industry. ▸

The Coast Guard believes that the current regulations have helped many fishermen survive casualties that would have claimed their lives had they not carried lifesaving equipment required by the Act. Yet, commercial fishing maintains its rank as one of the most hazardous occupations in the United States. Knowledgeable safety experts agree that the poor safety record of the fishing industry is influenced by the lack of preventive safety measures in regulation, economic pressures, fisheries management schemes that sometimes encourage fishing in poor weather, and the inherent risk associated with the working environment onboard fishing vessels.

Two Coast Guard personnel, *ABOVE*, practice applying splints and braces on a victim. *PREVIOUS PAGE* The *Van Loi* off the Hawaii coastline. USCG photos.

Throughout the years, the Coast Guard has made many unsuccessful attempts to improve safety in the fishing industry. Fishermen have consistently opposed mandatory requirements to apply more stringent material and design standards to fishing vessels while eschewing voluntarily programs that could increase compliance with existing safety requirements. Because of this it is difficult to establish a balance between good safety practices and economic viability. In fact, many fishermen genuinely believe that fishing and high-risk are synonymous. These attitudes are obstacles to significant improvement in fatality rates.

There are an estimated 120,000 documented and state numbered commercial fishing vessels in the United States.[1] Coast Guard efforts to help fishermen comply with existing standards have centered on the voluntary safety examination program during the last 10 years. This initiative has yielded limited success (less than 10 percent of all fishing vessels are examined annually) despite a huge investment by the Coast Guard in time and resources to promote the program by walking the docks, industry outreach events, and media communications with local fishermen. The dilemma remains. How can the Coast Guard persuade the remaining 90 percent of the industry to participate in the voluntary dockside examination program?

Coast Guard efforts to help fishermen comply with existing standards have centered on the voluntary safety examination program during the last 10 years. This initiative has yielded limited success (less than 10 percent of all fishing vessels are examined annually) despite a huge investment by the Coast Guard in time and resources to promote the program by walking the docks, industry outreach events, and media communications with local fishermen.

The Coast Guard was inspired to renew its efforts to improve safety in the fishing industry following the dramatic loss of eleven lives in four vessels off the East Coast in a three week time period between December 1998 and January 1999.[2] The cluster of sinkings and fatalities in a small geographic area shocked both the fishing community and marine safety community. Of those four vessels, three had Voluntary Safety Examination decals. These decals indicated that the vessel had been examined by the Coast Guard and met the safety equipment carriage requirements applicable to each vessel. So, why did so many fishermen die on vessels that apparently met the regulatory requirements? The Coast Guard immediately chartered a Fishing Vessel Casualty Task Force to evaluate the sinkings and to recommend significant measures to reduce loss of life and vessels. In March 1999, the Task Force delivered the report, *Living to Fish, Dying to Fish*.[3] In that report, the task force made 59 safety recommendations divided into seven categories. The categories ranged from improvements in communications to requiring better training of operators and crew. The main theme of the report was that the continued high loss rates in the commercial fishing industry was an unacceptable risk by today's standards and actions should be taken to reduce rates of injury, loss of life, and loss of property.

The Coast Guard convened two independent teams to evaluate the task force recommendations and determine which recommendations should be implemented based upon desired impact and ease of implementation. One team consisted of the Commercial Fishing Industry Vessel Advisory Committee members, a 17-member congressional authorized committee established to provide industry input to Coast Guard fishing vessel safety activities. The second team contained Coast Guard District CFVS Coordinators, who implement Coast Guard CFVS policy at the field level. Both teams ▶

generated similar critiques of the report. Their input was used to develop the Coast Guard's Commercial Fishing Vessel Safety Action Plan. The Plan included three short-term and eight long-term action items aimed at improving safety on fishing vessels. The teams agreed that the most important action items were initiatives to enhance operator/crew competency through better safety training, and efforts to increase the number of vessels examined for compliance with existing safety equipment regulations. A consensus was formed to pursue mandatory examinations similar in scope to the existing voluntary dockside safety equipment examinations and some form of verifiable safety training for crewmembers. Mandatory inspections and licensing schemes were determined to be most effective, but were rejected by both teams and senior Coast Guard management due to the political and economic barriers to implementation. The eight long-term action items identified in the Action Plan are:

1. Improve drill enforcement by requiring drills to be logged;
2. Complete a regulatory project on stability & watertight integrity for vessels between 50 and 79 feet in length;
3. Improve casualty investigations and analysis;
4. Improve communications with the fishing industry;
5. Coordinate fishery management with safety;
6. Mandatory vessel examinations similar in scope to existing exams;
7. Mandatory training-based certificate programs for operators & crew;
8. Change the boundary line to another line of reference for safety equipment.

The Action Plan, as outlined above, was fully endorsed by the Commercial Fishing Industry Vessel Advisory Committee.

Several of the CFVS Action Plan items had been contentious in the past, so, the Coast Guard organized seven regional listening sessions in different locations around the country to market the plan and receive public comments. Feedback from fishermen was obtained in Portland, ME; Norfolk, VA; Charleston, SC; Galveston, TX; Long Beach, CA; Seattle, WA; and Kodiak, AK. In addition to the listening sessions, the Coast Guard widely distributed Action Plan surveys to fishermen to obtain information from those who could not attend the regional listening sessions.

Most of the fishermen who provided input to the CFVS Action Plan were supportive of the goals and with few exceptions believe something needs to be done to improve industry safety. Fishermen voiced concern about the cost of government involvement, but, the vast majority admitted that the industry must reject the prevailing attitude that death and injury are a necessary part of fishing.

Even though the fishermen readily admit that many crewmembers are not adequately trained in emergency procedures, the action item to require mandatory training for all crewmembers was not supported by the industry due to the high crew turnover rates and the economic implications it has on small fishing operations. For these reasons, the Coast Guard revised the action item to require at least one member of the crew to be trained and certified as a drill conductor and to require periodic refresher training to keep the individual's skills current.

Surprisingly, the Coast Guard also received support on the action to seek authority to make current voluntary examinations mandatory. Legislative authority to mandate a periodic exam for all fishing vessels does not currently exist, but if authority is granted by Congress, it will allow the Coast Guard to finally reach the estimated 90 percent of the fishing fleet that do not request voluntary exams. This would help to ensure that all vessels examined are prepared for emergencies they are most likely to encounter at sea. Additionally, it will help level the playing field among fishing vessels that already comply with existing regulations and those who avoid compliance with current equipment requirements.

The final long-term action item to draw attention was the proposal to change the boundary line, the reference line that delineates what safety equipment is required, to another reference line, such as the territorial sea baseline. The intent is to help alleviate the ambiguity regarding safety equipment carriage requirements of the existing reference line for both the fishing industry and law enforcement personnel. The Coast Guard has the authority to make these changes, but is researching the issue further to ensure that this change will have a positive effect on safety.

The goal of the Coast Guard's Fishing Vessel Safety program is to increase the level of safety in the fishing industry so that it is no more dangerous than any other segment of the maritime community. Despite previous failed attempts to enact fishing vessel safety legislation and pending legislative proposals to mandate exams or revise existing requirements, there are many indications that the industry is ready to make a positive shift towards safety. We hope the recent tragedies involving the *Arctic Rose*[4] , *Amber Dawn*[5] , *Adriatic*, *Cape Fear*, *Beth Dee Bob*, and *Predator* sparked a change of heart.[6] We believe the time is right for the Coast Guard and the fishing industry to move forward cooperatively to improve safety and reduce the number of fatalities and vessel losses.

1 This number is based on an informal survey of CG Districts and known documented and registered vessels in their area. The accuracy has not been verified.

2 F/V *Adriatic* reported overdue January 18, 1999 4 crewmembers died; F/V *Cape Fear* sinking January 8, 1999, 2 crewmembers died; F/V *Beth Dee Bob* sinking January 6, 1999 4 crewmembers died; F/V *Predator* sinking December 28, 1998 1 crewmember died.

3 Living to Fish, Dying to Fish Task Force Report dated March 1999 can be obtained on the internet at http://www.uscg.mil/hq/g-m/cfvs/references.htm

4 Vessel sinking April 1, 2001 with 15 crewmembers onboard, no survivors.

5 Vessel sinking March 5, 2001 with five crewmembers, three survivors.

6 Coast Guard casualty reports can be retrieved at http://www.uscg.mil/hq/g-m/cfvs/references.htm.

With the vessel fully loaded with fish caught after numerous days of seemingly non-stop work, the crew finally heads for home. Exhausted by the trip and lulled by the calm weather, the crew soon begins to fall asleep until only one person remains awake at the helm.

He too begins to nod off, either confident that his dead man alarm will wake him or too tired to care.

The vessel moves steadily forward when suddenly everyone is abruptly awakened by the jarring ram that indicates the vessel has run aground.

The vessel quickly starts to flood as the men below struggle to grasp what is happening.

Everyone races to help stop the flooding but it is too late and they must abandon the vessel.

As they wait in the cold water for help to arrive, struggling to survive, each man privately asks himself,

"What went wrong?"

Improving Endurance in the Fishing Vessel Industry

By Jennifer Blain,
Human Element and
Ship Design Division,
Coast Guard Headquarters

For centuries, the fishing vessel community has endured unpredictable working conditions of all sorts: violent weather, long work hours, and more. And in such an environment, accidents like the one described above unfortunately occur. So how can they be prevented? There are many answers to this question, some of which are proven while some are theoretical. But rather than getting tangled up in the overwhelming complexity of answers, one must first understand the environment in which fishermen operate.

The Coast Guard's 1999 fishing vessel casualty task force report[1] noted the following: "The history of fishing vessel safety has been an ongoing struggle between the rights of fiercely independent individuals willing or resigned to accept the hazards of their profession, and of those from within and outside of the industry who attempt to mitigate the extreme dangers of retrieving the ocean's bounty. This history shows numerous initiatives to raise the level of fishing vessel safety through the development of standards consistent with other sectors of the maritime industry. However, few of these efforts have succeeded" (Section II).


Pillar Creek Beach in Alaska after a storm. Photo by PA1 Keith Alholm.

Fishermen accept risk as part of the business; fishing provides their economic livelihood. They will go out to sea in potentially adverse weather and remain as long as their vessel can reasonably hold fish. They will lose friends to storms, experience equipment failure, and at times, even exercise poor judgment, but most will continue to fish. In an age where both individuals and companies come to expect numerous job changes by people, fishermen as a whole have remained entrenched in the same work their relatives taught them. They in turn pass on their skills and jobs to their children. These are the conditions in which fishermen live and work. Acknowledging them and working with them, as opposed to pushing against these conditions, is necessary to improve the safety level of the fishing vessel community.

Recognizing that fishermen accept the hazards associated with fishing, the focus should therefore be on factors *within* that environment that can improve safety levels. One primary solution is to focus on the fishermen themselves and their ability to endure long days at sea.

Why do some people have difficulties maintaining their endurance, struggling to perform within safety limits while still maintaining alertness and controlling fatigue? The simple answer is that you can't order someone to stop being tired, no matter how many Coast Guard or company regulations are created. Too many accidents where lack of endurance has been a major or contributing factor have proven that. The only successful way to improve crew endurance is through an industry-wide cultural change that encourages and supports new ways of doing business. Understandably, this change is neither easy nor quick.

Also hampering efforts is tradition, which is a proud part of the maritime community. Some might say it's the backbone. Mentors teach new recruits the same way they were taught. That's both good and bad. Good habits and smart tricks-of-the-trade are passed on, but so are the bad habits.

One factor that affects crew endurance is fatigue, or "impaired alertness," and it is a fundamental problem for all 24-hour-a-day operating industries. Mariners are very susceptible to this as a result of the combination of industry-specific factors such as shift work, and life and work on a seagoing ship. Working at sea, a physically demanding environment, requires constant alertness and intense concentration. Seafarers with impaired alertness become more vulnerable to the many hazards on-board ships. This results in personal injuries such as getting caught in the equipment, slipping, or falling overboard. It can even result in death to an individual or an entire crew. According to the Coast Guard's Report, "Data shows that fishermen continue to be among the most dangerous occupations, having far higher fatality rates than fire fighters, police officers, and truck, taxi, and delivery drivers. In the great majority of fishing industry cases where causes can be determined, the casualties are preventable" (Section IV).

Effectively dealing with endurance problems requires a holistic approach. There is no one-system approach or "canned solution" to addressing endurance, but there are certain principles — such as lifestyle habits, rest, medication, and workload — that must be addressed in order to gain the knowledge and the understanding to manage this human element issue.

To help people understand and implement this holistic approach, the Coast Guard has developed a Crew Alertness Campaign. This Campaign is a non-regulatory approach to educating mariners on factors that affect crew alertness and providing insight on how to manage them. It recognizes that awareness and education of the issue is an effective way to begin to shift the current culture toward a ▶

safer working environment. The Campaign provides the means to disseminate information and educational materials, and includes practical guidance to the marine industry in many possible forms such as videos, brochures, posters, seminars, industry days, and more. Most importantly, the Campaign provides a venue for mariners to talk about crew alertness and share their insight and concerns with the Coast Guard.

The Coast Guard and its Research and Development Center are currently working on a long-term project that will develop materials for the marine industry to use and assist in implementing crew endurance management programs. Some of these materials include a guidebook, computer-based training modules, a CD-ROM with presentations that can be used for training, a software decision-support system to help mariners manage their programs, and other materials to be readily used in educating and training mariners. The Crew Alertness Campaign is only one milestone in this long-term project that will begin to educate and increase awareness about alertness and fatigue issues.

In addition to this internal partnership, the Coast Guard also values partnering with industry. This increases everyone's sense of ownership, helps develop a good working relationship, and provides increased credibility with this Coast Guard/Industry activity. The Coast Guard, in partnership with the American Waterways Operators, recently developed a "Stay Alert For Safety" brochure, which provides people with information to increase awareness of the damaging effects of fatigue and offers some simple solutions to managing it better. They also have a formal partnership with the Chamber of Shipping of America to test and evaluate some of the Campaign's educational materials. On the international front, the Coast Guard is the principal member of the United States delegation to the International Maritime Organization. They are leading IMO's Correspondence Group on Fatigue that has developed practical guidance to assist interested parties to better understand and manage the issue of fatigue.

Photo courtesy PTP organization.

The Crew Alertness Campaign is designed for use throughout the maritime community, but it can be especially beneficial to the fishing community for many reasons. First, the Campaign provides useful, informative material on a subject that is universally agreed upon as a major problem, endurance, but allows the individual or organization to choose their level of involvement. The Campaign's non-regulatory aspect sends a "We're here to help" message without the threat of mandatory compliance.

Second, the information and materials from the Campaign can be readily used to train fishermen. It has been specifically designed so that individuals and organizations can "cut-and-paste" the parts that apply to their situation. A group can clearly find information about the factors that are negatively affecting their crew endurance levels and learn how to implement practical solutions without having to sift through unnecessary material.

Third, and most simply put, the information just makes good safety sense. A lack of crew endurance can lead to such problems as mariners ignoring stability issues, forgetting or not paying attention during drills, and inadequately maintaining the vessel and equipment. These problems can result in major catastrophes, so it makes sense to try and prevent them from happening.

So how can accidents be prevented? According to Captain Jeffrey Lantz, Chief, Office of Design and Engineering Standards at Coast Guard Headquarters, the answer is cultural change. "We need to create a people-focused environment in the maritime community, and make people aware of endurance," says Captain Lantz. "The issue of crew alertness is one that requires involvement from *all* parties who have a direct impact on vessel safety. By taking a partnership approach with the maritime community, we can all achieve a better understanding of crew endurance management, which in turn translates to a safer maritime community."

Although fishermen will continue to set out to sea in potentially unfavorable conditions, efforts like the Crew Alertness Campaign will hopefully help fishermen better understand how to improve their endurance during those long and demanding trips. In doing so, the entire maritime community will benefit from their improved safety efforts, while the fishing community will achieve something even more valuable . . . fishermen arriving home safely.

[1] *Living to Fish, Dying to Fish, Report of the Fishing Vessel Casualty Task Force.* March 1999.

Maritime Leaders Propose National Action Plan for Recruiting and Retaining American Mariners

by CAPT Ernest Fink, Commanding Officer, National Maritime Center, USCG
and CDR Dan Croce, Activities, New York, USCG

Senior maritime leaders recently took the first step in addressing industry-wide concern over recruiting and retaining qualified crews for American commercial vessels. On May 23-24, 2001, a broad spectrum of approximately 140 senior maritime leaders participated in an intensive two-day conference at the U.S. Merchant Marine Academy in Kings Point, NY. Participants at the conference, titled **Maritime Careers: Creating an Action Plan for Recruiting and Retaining American Mariners**, developed action plans to attract and retain quality crews on commercial vessels.

The Conference was the first of its type to include a cross-section of industry sectors, labor, Government and maritime academies. It was sponsored by the U.S. Coast Guard; Marine Transport Corporation; Kirby Corporation; Moran Corporation; Maritrans Inc.; the Marine Engineers Beneficial Association; American Maritime Officers; International Organization of Master Mates & Pilots; and the Seaman's Church Institute of NY & NJ. Attendees included maritime union representatives; deep-sea, inland, Great Lakes, research, offshore oil supply and coastal vessel operators; maritime academies; training institutions; U.S. Coast Guard; Maritime Administration; Military Sealift Command; and other maritime organizations and mariners.

The purpose of this Conference was to:

- Develop a shared understanding of the current state of Mariner recruiting in the United States today,
- Discuss current trends and issues affecting mariner recruitment and retention,
- Identify best practices and opportunities for improvement,
- Determine industry-wide issues and develop action plans by sector, and
- Create commitments to follow through with the implementation of the actions agreed upon at the Conference.

The enthusiasm and passion among the participating maritime leaders resulted in an in-depth perspective on the issues. They made a commitment to develop industry-wide solutions to the looming problems in the American Maritime Industry and developed a draft action plan to meet the goals of recruiting and retaining qualified mariners in this country's extensive, but little known, maritime industry.

A comprehensive conference report will be made available to conference participants and maritime policy makers, and will be available on the Internet. In addition, the Conference co-chairs, RADM Paul J. Pluta, the Coast Guard's Assistant Commandant for Marine Safety and Environmental Protection, and Richard du Moulin, CEO Marine Transport Corporation ("A Crowley Company"), along with other participants plan to present the results of the Conference to key government officials involved in maritime policy.

RADM Robert C. North, USCG (Ret.), who initiated planning for the conference said, "We proposed the conference to address growing problems in the American maritime industry: How can we attract and retain quality crews to operate commercial vessels? The conference was a first step in bringing the diverse sectors of the American maritime industry together to address a common issue."

The Conference consisted of a series of four working sessions separated by plenary sessions to share and discuss the information developed by work groups in the working sessions. Each working session built on the previous one. The work groups first created a list of issues and trends impacting mariner recruiting and retention. Second, they discussed best practices and opportunities, industry-wide and by sector. The work groups then prioritized the lists and drafted industry-wide and sector action plans to address the priorities. During the last work session and closing plenary session, the Conference participants made commitments to follow up work on this massive effort now put in motion.

RADM Pluta participating in a work group. USCG photo.

Mr. du Moulin observed: "The conference exceeded all of our expectations. We were gratified given the extremely diverse nature of the American maritime industry, how many concerns we shared and how many joint action plans resulted. We look forward to unified industry action on future American maritime policy issues."

There was a strong consensus among the Conference participants as to the principal issues and trends impacting the mariner recruiting and retention, resulting in a plan designed to address the following key issues:

- Government maritime policy including tax relief and other incentives for mariners,
- Mariners' quality of life and lifestyle issues,
- Regulatory burdens such as STCW – 95,
- Public awareness and education about the American Maritime Industry,
- Criminal liability for pollution-related marine casualties, and
- Mariner recruitment and career path.

Richard du Moulin, CEO, Marine Transport Corporation, *ABOVE*, and RADM Paul J. Pluta, *BELOW*, plan to present the results of the Conference to key government officials involved in maritime policy. USCG photos.

The issues of training, industry-wide coordination and recruitment strategies and criteria were also imperative to address. Steps were established to follow through with the momentum created by the Conference participants committed to work on improvements in those areas identified above as high priority.

The Conference co-chairs will meet with Secretary of Transportation Mineta to discuss this Conference and its results as an element of the Department of Transportation Marine Transportation System initiatives. One of the recommendations of the Conference participants that will be discussed during this meeting is the need to establish support and awareness of American Maritime issues.

The Maritime Administration will examine those issues relating to maritime policy such as tax relief and will develop a central point of contact and information for recruiting mariners. Educational institutions have committed personnel, meeting facilities and support to assist the U.S. Coast Guard and Maritime Administration to rationalize and harmonize STCW – 95 requirements and the U.S. merchant marine licensing and certification process. The Coastal Tug and Barge Sector will provide assistance to the STCW issue at the CEO level, continue to pursue the "strict liability " statutes issue, and further examine lifestyle issues.

The U.S. Coast Guard will link its role in the Marine Transportation System initiative to public outreach for this issue; work with the STCW – 95 issue group for final STCW – 95 implementation. They will also link three websites to mariner recruiting and retention, review OPA 90 and criminal liability issues with the Coast Guard Chief Counsel and facilitate a national dialog with the Department of Justice and the Environmental Protection Agency. In addition, the U.S. Coast Guard will seek to establish better relations with state and local jurisdictions on marine safety regulations.

> The enthusiasm and passion among the participating maritime leaders resulted in an in-depth perspective on the issues. They made a commitment to develop industry-wide solutions to the looming problems in the American Maritime Industry and developed a draft action plan to meet the goals of recruiting and retaining qualified mariners in this country's extensive, but little known, maritime industry.

Marine Transport Corp. and Maritrans Inc. each committed to contribute $10,000 towards the support of further work of recruitment and retention through a second Conference in a year to examine the progress on the determined action items.

RADM Pluta, in his closing remarks to the conference, expressed his optimism about the results and added, "The spirit of cooperation I have observed over the past two days is truly remarkable, and I'm confident it will carry us through as we work together on the resolution of these critical issues. Partnership is key! U.S. mariners are second to none and deserve our best effort. The U.S. Coast Guard is proud of its leadership role in moving this plan forward."

Mariner's Seabag

FISHING VESSEL FATALITY CAUSES AND MAN OVERBOARD

By Jerry Dzugan, Director,
Alaska Marine Safety Education Association

When one thinks of the most dangerous waters in the United States and the most prevalent cause of death for commercial fishermen, capsizing in the Bering Sea would most likely come to mind. Major casualties in Alaska such as the "A" boats, the Aleutian Enterprise, and most recently the Arctic Rose, have underscored the risks involved with fishing in Alaska.

However, in a survey of U.S. Coast Guard fishing vessel casualties in the six-year period from 1995 to 2000, the major cause of fishing fatalities was found *not* to be from boats capsizing, flooding, grounding or catching fire. The vessels involved in the largest segment of commercial fishing fatalities were, in fact, intact. Surprisingly, almost a third of all fishing related deaths during this period, 122 out of a total of 380, were due to man overboard events—35 percent occurring in the Gulf of Mexico. These figures show that man overboard events in the Gulf of Mexico were the leading cause of fatalities in the last six years in the U.S. fishing industry, accounting for 11 percent of all fishing fatalities. The second leading cause of fishing related deaths in the U.S. were capsizing events in Alaska, accounting for 7 percent of all fatalities.

The Coast Guard analysis includes only fishing related fatalities from heart attacks or other natural causes, alcohol or drug overdoses, suicides or other unknowns are not included. Some fatalities from "unknown" causes were probably due to either sinking or capsizing since the entire vessel was lost. However, the unknowns were few in number and would have altered the results by only a few percentage points.

The following table displays the leading causes of fishing vessel fatalities from 1995 through 2000.

Cause	Fatalities
Man Overboard	122
Sinking	16
Capsizing	74
Deck-Related Injury	31
Collision	12
Diver Related	17
Fire	8
Total	**380**

Since man overboard events are such a significant hazard to commercial fishermen, prevention steps and procedures should be emphasized.

Safe deck work practices are of paramount importance. Non-slip surfaces must be maintained. Fatigue may also be a factor in man overboard incidents and work schedules should be adjusted to make the most of rest periods. Training crews to effectively respond to a man overboard emergency should be a part of every fishing vessel's monthly emergency drill. Man overboard alarms are available on the market that set off an alarm in the wheelhouse when the wearer of the sending unit falls in the water.

Most importantly, life jackets should be worn when on deck. USCG approved or unapproved life jackets come in a variety of styles, including vests, suspenders, belt pouches and more traditional styles. "It is too bulky to work in," is no longer an excuse for not wearing a life jacket because there is a design for almost any working situation. In the last six years at least 122 fishermen would have had a better chance had they been wearing one.

Which is the best life jacket? The answer is still "the one you will wear."

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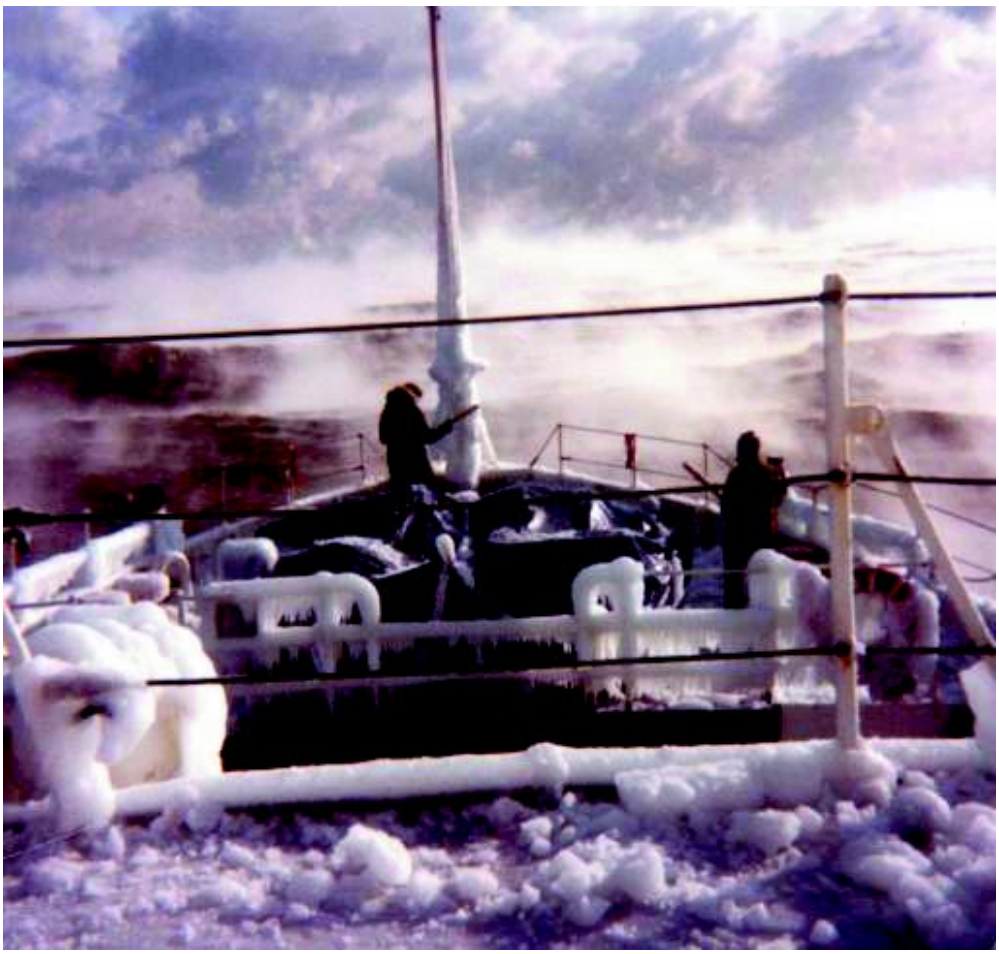

CGC *Evergreen* Fisheries Patrol, Georges Bank, MA; Crewmembers from the cutter go out on deck with baseball bats to remove heavy ice accumulated during a February fisheries patrol. USCG photo by LCDR Jim McPherson.

An escape scuttle aboard a Coast Guard vessel. Photo by PA1 Pete Milnes.